In The Past 5 Years . . . The Industry Has Spent $179 Million on New Equipment

In 1952 scrap yard operators spent $69.3 million on new equipment . . . Biggest expenditures were for balers and cranes . . . Operators cite ups and downs of market as problem.

Scrap yard operators spent about $69 million on new equipment in 1952. In the past 5 years their equipment expenditures totaled approximately $179 million. Although buying plans for this year are far from complete, they have already planned purchases of more than $14 million worth of equipment.

These eye-popping figures result from an IRON AGE survey of yard operators. The survey was conducted during the fourth quarter of last year, and tabulations have just been completed.

Several important conclusions may be drawn from the survey:

(1) Scrap yard operators purchase a great deal more heavy equipment than has been commonly realized.

(2) Mechanization of scrap yards is going forward at a startling pace.

(3) Past and present purchases of equipment should assure a large replacement market for equipment in the future—even after the first phase of mechanization has been completed.

(4) While mechanization has gone a long way toward solving the problem of high labor costs, it has created new problems which are frustrating many in the industry.

Here's how THE IRON AGE survey was conducted:

Letter-type questionnaires were sent to the 1350 members of the Institute of Scrap Iron & Steel. The questionnaires were of a type that could only be answered by brokers or dealers who operate yards. About 50 Institute members do not.

Of the approximately 1300 yard operators, 132 had replied to the questionnaires at the time results were tabulated. This is a return of slightly more than 10 pct.

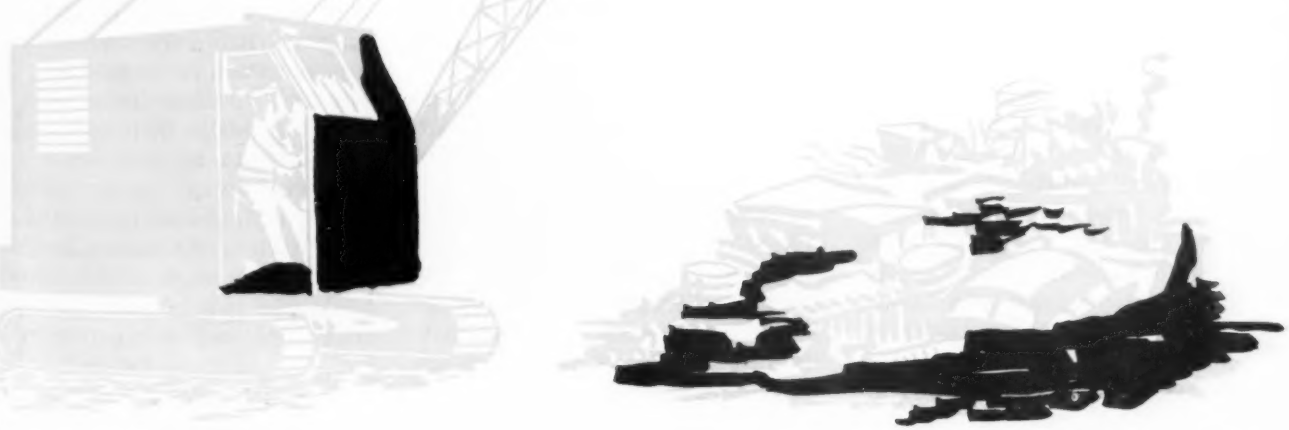
Yards answering the questionnaires also accounted for approximately 10 pct of the tonnage handled by the industry.

Total tonnage handled in 1952 by those replying was 2.6 million gross tons. Of total purchased scrap shipped in 1952 about 80 pct of 32.8 million tons, or over 26 million tons, moved through yards. Thus tonnage handled by yards answering THE IRON AGE survey is close to 10 pct of total tonnage handled by yards.

Therefore the sample was expanded on the assumption that respondents constituted 10 pct of the scrap yard industry. The close correlation between number of replies and amount of tonnage reported is regarded as a check of reliability of the sample.

Estimated equipment expenditures of the entire industry, based on extension of the samples, is shown in the charts on the second and third pages of this story.

Of the $69.3 million yard operators spent on equipment during 1952, $27.7 million were spent on balers. This was by far the larg-



est amount spent on any single type of equipment. Next came cranes with 1952 expenditures amounting to $17.8 million. It is logical that these items should top the list because they are the more costly pieces of capital equipment.

But they did not top the list of expenditures planned during 1954. This is probably due to their relatively higher cost. Many yard operators reported purchase plans for 1954 far from complete. Ultimate total will undoubtedly be much greater than amounts indicated by their replies, which only indicated purchases that had already been planned for 1954 by the third quarter of 1953. A number of yard operators indicated they were taking a cautious approach on 1954 expenditures, especially in view of sagging demand during the second half of 1953.

The scrap industry is wrapped up in pessimism as its prime consumer, the steel industry, is reluctant to place substantial orders because of some production uncertainty and still heavy stocks of scrap and iron ore. In a market that sagged considerably in fourth quarter '53, prices have been persistently skidding. Last week THE IRON AGE No. 1 Heavy Melting Scrap Composite declined to $29.67 per ton. Last year for the comparable week it was $42. In March 1953 the composite stood at $44.18.

Although almost 112 million tons of steel were made in 1953, only about 32 million gross tons of purchased scrap were consumed—contrasted to 33.8 million tons in 1951 when 105 million tons was made.

As IRON AGE survey figures will testify the scrap industry invested heavily for expansion in recent years. That makes the current sales slump all the more painful. Scrap men point out that their industry is geared to collecting up to 40 million tons per year which they maintain can save America's iron ore resources many millions of tons annually—if scrap is more fully utilized.

For an industry as virile as scrap, which has met the most desperate challenges, pessimism does not mean despair. Though the industry is now in the doldrums it realizes that its future hinges on recovery of the steelmaking rate.

A reasonably good shipping year is probable in 1954—after the industry overcomes its snail's pace start. It is hoped that the near months will witness a substantial recovery of shipments. This in turn may work to bolster declining prices.

Scrap men know that they have undergone the most drastic shakeup of any industry. Prices have fallen sheerly in the wake of the shipment rate. Some marginal sources of scrap coaxed into existence to meet crisis shortages have been allowed to wither.

Of all the problems bothering yard operators the ups and downs of their business are causing most concern. Rapid trend toward more mechanization is accentuating this problem. Dealers repeatedly referred to this in their comments.

It used to be that when mills stopped buying, yard operators could simply reduce operations and wait until their customers came back into the market. All they had to do was pull in their horns, reduce costs, and wait out the market.

Today it's a lot different. Yard

operators have invested large sums of money in heavy equipment. They had to in order to move large tonnages of badly needed scrap at low cost. Now when the mills stop buying, fixed costs of the yard operators continue.

Waiting out the market has become a pretty costly proposition. Several dealers commented that consistent orders had become more important to them than price.

A number of comments by yard proprietors are on the next page.

The scrap industry is a prime example of free enterprise. The industry handles more than a billion dollars worth of business a year.

For the past 3 years scrap dealers and brokers have been buying, processing and selling at the rate of more than 27 million tons a year. At an average price of $40 a ton this comes to more than a billion dollars. Add on the industrial and railroad scrap sold through brokers or dealers but not processed in yards and the totals are nearer 32 million tons and $1.25 billion per year.

Expansion of the industry is also indicated by the number of new yards that have been started. Of the 132 yards reported in our survey, 13, or about 10 pct, started operating after 1940. This was brought out when they were asked to report tonnage shipped and number of people employed in 1940. Thirteen answered that they were not in business at that time.

Mechanization of yards is also indicated by tonnage shipped per worker. However correlation on this was not considered reliable because tonnage reported was 1940 and 1952, while workers were reported for 1940 and 1953.

If employment in 1952 had been requested, it would have been possible to get a fairly exact indication of mechanization from ratio of workers to tons handled. Despite this handicap it is still possible to get some indication of the mechanization trend.

In 1940 reporting yards handled 982,832 tons of scrap while employing 1680 yard workers. This is an average of 585 tons per worker.

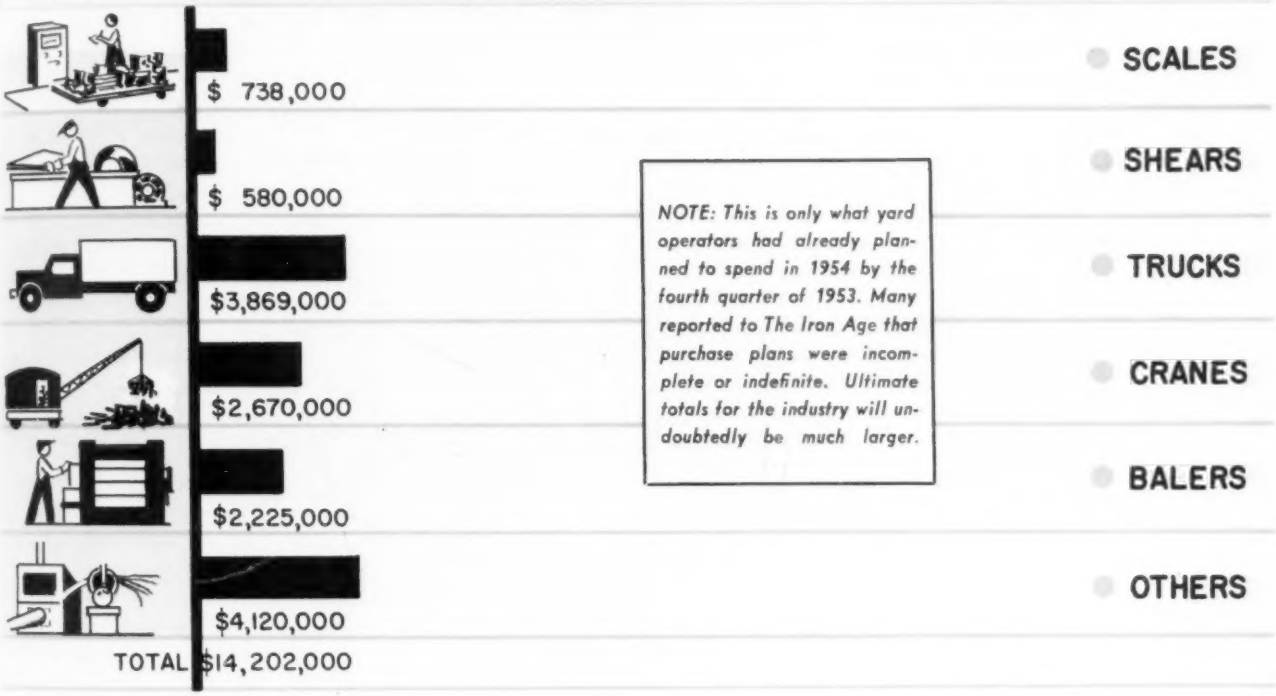
In 1952 the reporting yards shipped 2,609,710 tons. By using 1953 employment (believed about the same as 1952) tonnage per worker comes to 846. The apparent increase in tonnage handled per man during the 12-year period is 45 pct.

Rapid tax amortization was undoubtedly an inducement to expansion and mechanization during part of the period covered by the survey. Of the 132 yard operators answering the questionnaire, 59 reported they were being allowed fast tax writeoffs on some expenditures made during the past 5 years for expansion and modernization.

Like the nation's economists, scrap yard operators doubt that 1954 business will match 1953's boomtide. Of those who were willing to take guess at next year, 109 expected business to be worse, 13 expected it to be better, and 4 expected it to be virtually unchanged. Regarding their own company, they were a bit more optimistic: 96 expected their company to fare worse, 20 expected it to fare better, and 12 expected it to fare the same as in 1953.

These figures indicate that yard operators believe they can do better than the industry average.

WHAT SCRAP INDUSTRY WILL BUY IN 1954



NOTE: This is only what yard operators had already planned to spend in 1954 by the fourth quarter of 1953. Many reported to The Iron Age that purchase plans were incomplete or indefinite. Ultimate totals for the industry will undoubtedly be much larger.

Yard Operators Sound Off on Relations

◆ They were asked "What do you think might be done to improve relations between the scrap industry and consumers?" Almost every respondent answered the question, some very bluntly.

◆ Answers reflect anxiety over ups and downs of scrap business. But many feel that education and mutual exchange of information will lead to better understanding and eventually better relations.

Yard operators aren't timid about saying what they think. They were asked "What do you think might be done to improve relations between the scrap industry and consumers?" Here are some of their answers:

"There's something wrong some place . . . How can a going industry go from record production to nothing?"

"Dealers should have a better opportunity to develop merchandising good will on an individual basis."

"Stabilize markets by purchasing regularly tonnage produced."

"Institutional advertising of the industry."

"Education: Meetings between mill and yard people to exchange information on problems and requirements . . . Most meetings now are between brokers and mills."

"Free competition: Offer to the consumer quality controlled scrap —certified for better melting value."

"More export business."

"Mills should help stabilize market . . . Up one day, down the next, and no market at any price the next, is ruinous."

"Using more scrap in relation to blast furnace operations."

"Closer relationship with mutual understanding of each others' problems."

"Better preparation by dealer . . . Tolerance by consumer for honestly prepared material slightly off grade . . . Possibly inspection by neutral source of rejected cars."

"Consumer should buy year around instead of letting dealers hold scrap 'til market falls."

"I don't think relations are bad."

"Ship quality sold."

"Consumers to regard us as conscientious industrialists, not 'junk dealers.'"

"Better understanding of mutual problems and less taking advantage of the other when the opportunity arises. Dealers should give consumers what they pay for and consumers should pay a reasonable price and establish steadier market."

"Continuous purchasing . . . better preparation."

"Closer relationship between mills and suppliers: Problems are mutual, can be solved."

"Mills should maintain more steady purchase policy . . . Orders, not price, is our main concern at all times."

"Spread business among more suppliers."

"This subject would take many hours to cover . . . however, sincere desire by both to study and understand mutual problems might be a good starting point."

"Keep prices commensurate with finished products . . . Reduce freight rates on long hauls."

"Mills should stop shading their eyes to inferior quality in time of shortage . . . consumer should remember he at times is responsible for inadequacies in preparation."

"Better service and public relations."

"Try to help each other stay in business instead of putting each other out of business."

"Legalizing purchase contract."

"Keep price of scrap in line with price of steel . . . Scrap has gone down 40 pct while steel went up 12 pct."

"Set up system of bonus and penalty."

"Give broker flat $1.50 per ton and let mill set price on all grades."

"Goodwill."

"Steel companies don't save any money in the long run by staying out of the market to depress prices . . . Why shouldn't scrap prices be as stable as iron ore, coal, or limestone?"

"Steadier buying by mills . . . Consistency in the buying programs."

Acknowledgments

The Iron Age wishes to thank the many scrap yard operators who helped with this survey by taking time to answer our questions.

We also wish to thank all those who lent assistance and advice. Special thanks to Edwin C. Barringer, executive secretary of the Institute of Scrap Iron & Steel.

IKE: What His Plans Mean to Industry

Highlights of the President's State of the Union message . . . What's planned on taxes, defense spending, federal budget, labor, mobilization—By *Washington Bureau.*

Congress settled down to work this week with one eye on President Eisenhower's new blueprint for peace and prosperity and the other on next November's national elections.

Generally speaking, most of the programs in Mr. Eisenhower's State of the Union message are acceptable to Republicans and Democrats alike. Republicans believe their party's chances for success at the polls this year have been tremendously elevated by the President's commitments for continued business prosperity and for an uncompromising campaign to establish world peace. Democrats promise support for "all points in the national interest," but warn they will slug it out on such points as "excessive" budget cutting — particularly in defense spending.

Key to Mr. Eisenhower's "prosperous peace" is (1) continued defense procurement at relatively high levels, (2) a "well-timed and vigorous action" program to be used if business should slump dangerously.

Here are the prime areas of interest to industry in the 1954 legislative program now under study by Congress:

Tax Cuts Coming . . . Mr. Eisenhower requests cancellation of the scheduled cuts in corporation income tax rates, in excises, and no further reductions in individual income taxes. But current congressional thinking favors at least some reductions in excises, a "bonus" reduction (probably 5 pct) in individual income rates. Extension of the corporation income tax rate at 52 pct is favored among Capitol Hill leaders over the alternate plan of trimming the tax to 50 pct and omitting relief in the individual income and excise areas. Tax relief in the form of fast amortization and in 24 other areas is to be unveiled next week in a special White House tax message to the Congress.

Economy in Transition . . . The Administration believes any current disturbances in the economy are the result of the transition from a wartime, partial mobilization state to peacetime. The White House will send to Congress on Jan. 28 its plans to offset any threatened recession. They will include proposals for credit policies, taxes, agricultural programs, public works programs, and programs to foster more foreign trade.

Defense Spending Changes . . . Emphasis is to be given expansion of air power and reliance on atomic firepower over manpower. Defense budget will be cut from about $42.4 billion this year to about $38 billion for the next fiscal year. Mobility of the armed forces is to be stressed.

Budget Slashed . . . Some $5 billion in reductions below last year's figure will be proposed in the budget message on Jan. 21. Added to last year's cuts, government costs will have been trimmed $12 billion in 2 years. New budget should total $66.5 billion. Although income will just about equal outgo, the country will still have to run a deficit until the multi-billion dollar backlog of previous appropriations is paid off. More deficit financing is in prospect. President Eisenhower will "renew" his request for another increase in the present $275 billion statutory debt limit.

"They make it very plain what's in it for you around here."

Fast Amortization . . . Definite encouragement to the machinery industry is contained in Mr. Eisenhower's disclosure he will ask Congress for depreciation changes. The White House is expected to recommend that purchasers of machinery and plant equipment be permitted to take depreciation deduction at the rate of double the straight-line percentage (example: 5 pct annually for 20 years) and then apply this percentage annually to the undepreciated balance —not to the original cost. Effect would be fast writeoff in the early years of the anticipated life of each piece of equipment.

Labor Changes Mapped . . . Modifying its stand of a year ago, the Administration doesn't believe now that any change in basic principles of the Taft-Hartley Act are called for. Some minor "improvements" were recommended. (See page 73). With Its Economic Report on Jan. 28, the White House will ask for an increase in the minimum wage rate as well as additional coverage. Also, the Administration is urging Congress to vote extension of social security coverage.

Mobilization, Stockpiling . . . A realistic mobilization base and an adequate stockpile to support it are to be major goals. Planners will try to make certain there is sufficient capacity for quick conversion from partial to full mobilization. For the first time, military requirements for 1000 major military items are known. More are to go on the list. It is clear White House believes the St. Lawrence

—Government—

Seaway essential to mobilization, although it may not press in '54.

Social Security . . . Action to expand rehabilitation of the disabled and to extend social security to an additional 10.5 million persons was urged by Mr. Eisenhower. Hearings on this measure by Ways and Means Committee have been promised, but Rep. Carl Curtis, R., Neb., is also asking for consideration of his own bill (H. R.6863) to broaden social security.

Probability is that the committee will decide not to endorse either bill but will draft a new measure. New bill might include extension of the social security program to additional millions of people; increase minimum payments to recipients of old-age and survivors' insurance (OASI) benefits; raise the amount a retired person may earn without losing OASI benefits.

Housing . . . While the President is all out for private enterprise, he is also for "good homes" for everybody, believes the government must lend a hand in various ways. On Jan. 25, he will recommend that Congress continue the present public housing program, revise the slum clearance program, streamline the federal home mortgage insurance program, insure long-term mortgage loans with small down payment for low income families.

Foreign Aid Down . . . White House is making no compromise in its belief that this nation's fortunes are interlocked with those abroad. But there will nevertheless be reductions in economic assistance. Military aid won't be cut, however. Continued support of Nationalist China and additional military help to Indo-China will be proposed in later messages.

Atomic Energy . . . U. S. is ready to discuss the atomic bomb with Russia — providing the Soviet Union doesn't stall. We would not hesitate to use atomic weapons against an aggressor. Congress is asked to grant authority to instruct friendly nations how to use certain nuclear weapons.

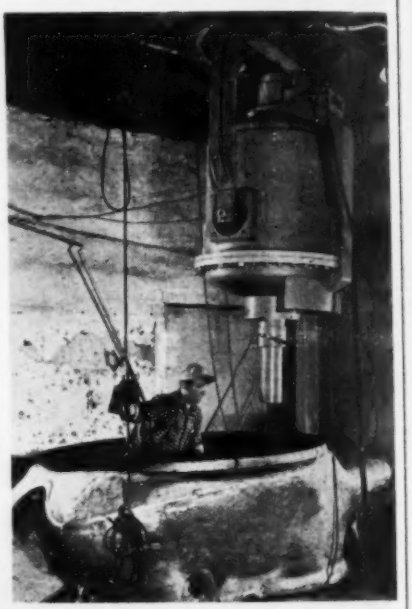
—Ordnance—

TANK TURRETS being removed from the heat treating furnace.

How to Make a Tank Casting

After recently completing orders for castings for the M47 medium tank, Blaw-Knox Co.'s Union Steel Castings Div. has been concentrating on castings for the Army's new medium tank, the Patton 48.

Acting as subcontractor it supplies Fisher body with the turret and gun mount shield for the Patton 48 and previously furnished Ford Motor Co. with the same castings when Ford was still producing M48's. When working on the M47 Union Steel Castings supplied Chrysler and American Locomotive Co. with turret and rear hull castings.



USING 1 million volt X-ray tester, operator checks for internal flaws.

EXTERIOR FIXTURES are welded to the tank turret casting.

WORKER machines tank turret casting at Union Steel Castings Div.'s plant.

GROWTH: Diversification's the Secret

Case history of H. K. Porter Co.'s rags-to-riches climb . . . Company added 15 firms since the 1930's . . . How diversification upped sales, profits—By *J. B. Delaney.*

Parlaying one bankrupt company into a robust family of diversified industries is a good trick, even in these days of eye-opening industrial accomplishments. But such is the rags-to-riches story of H. K. Porter Co., Inc., Pittsburgh.

It began in the late Thirties when Thomas Mellon Evans, then 28, bought control of the original H. K. Porter Co., a down-at-the-heels outfit that manufactured steam switching locomotives. The last chapter is still being written.

In the intervening years since he acquired H. K. Porter Co., Mr. Evans has bought a total of 15 companies and combined them to form the present group. They produce steel, industrial rubber goods, stainless and alloy wire, electrical equipment, wire rope, forged steel fittings, hydraulic presses and oil field equipment.

How Porter Does It

Net current and fixed assets total approximately $26.5 million, compared with $947,000 in 1940. Net sales last year were about $64 million, net income approximately $2.4 million. Comparable figures for 1940 were $675,000 and $31,000, respectively.

H. K. Porter Co. has a simple policy toward companies purchased outright or controlled through purchase of stock. First, they are usually closely held or family-owned corporations. Second, if the new addition to the Porter family fails to fit into the operational picture or does not earn a fair return on the investment, it is sold.

After buying the original Porter company, President Evans reorganized it and diversified production to include process equipment and, with outbreak of World War II, shells for the armed forces. During 1943-45, four companies were purchased. One of them was sold later at a profit of over $1 million. Still later, four additional companies were brought into the fold, including Hinderliter Tool Co., which is still an operating division.

The current development period began in 1949 and continued through December, 1953 as seven additional companies were acquired.

It Keeps Growing

Present Porter divisions and dates of acquisition are:

1946—Hinderliter Tool Co. Div., Tulsa, Okla., manufacturer of oil field equipment.

December, 1949 — Quaker Rubber Corp., Philadelphia, producer of industrial rubber goods, including belts, hose, sheet packing, and molded rubber products.

September, 1950—Connors Steel Div., Birmingham, Ala., an electric furnace mill producing concrete reinforcing bars, merchant bars, bale ties, hoops, fence posts, and binding straps.

December, 1950 — Delta-Star Electric Div., Chicago, manufacturer of high voltage fittings, switches, conductors, supports and related equipment for controlling and transmitting electricity.

September, 1951 — Buffalo Steel Div., Tonawanda, N. Y., producer of merchant bars, fence posts, roofing tees, concrete reinforcing bars, shelving angles and other special shapes.

September, 1952 — The Watson-Stillman Co., Roselle, N. J., manufacturer of hydraulic extrusion and plastic injection molding presses.

Watson-Stillman Fittings Div., Roselle, N. J., producers of forged steel fittings.

July, 1953—Leschen Wire Rope Div., St. Louis, manufacturer of wire rope.

December, 1953 — Alloy Metal Wire Co., Prospect Park, Pa., producer of Monel metal, stainless and alloy steel wire, rod and strip used principally in the electrical, electronic and chemical fields.

Porter has spent over $2 million expanding and modernizing Connors Steel Div., increasing capacity from 94,000 tons to 140,000 tons. A substantial amount has also been spent for modernization of Buffalo Steel Div., and another $2 million has been put into Quaker Rubber, where finished rubber products capacity was increased 30 pct.

When a company is acquired, one of Porter's first steps is to sell or write off obsolete, slow-moving inventories. A close look is taken at management personnel. When these and other preliminaries are disposed of, the new company is operated on a completely decentralized basis. Divisional top management is placed on a salary plus bonus basis.

All He Got Was Advice

Porter has gone into the market and bought its own stock when shares became available below net current asset value. Between 1947 and 1951, the company bought and retired 148,458 shares of common stock for this reason, laying out approximately $1.2 million.

Mr. Evans, a graduate of Yale, is 43. Getting out of school in 1931, he worked for a time in the advertising department of Gulf Oil Corp. He saved his money, picked up a few dollars in the stock market and built a nest egg of $10,000. At 28 he bought control of Porter.

H. K. Porter Success Story

	Net Sales	Net Income
1940	$ 675,000	$ 31,000
1941	1,990,000	203,000
1942	3,995,000	154,000
1943	8,491,000	238,000
1944	24,905,000	346,000
1945	24,948,000	653,000
1946	7,358,000	714,000
1947	9,435,000	155,000
1948	10,730,000	163,000
1949	9,358,000	190,000
1950	24,532,000	1,021,000
1951	48,449,000	1,732,000
1952	50,754,000	1,523,000
1953	64,180,000*	2,459,000*

*Estimated

STORAGE TANKS: Off to Fast Start

Industry expects to erect as many storage tanks in first quarter 1954 as in same period last year . . . Overall business for year will be slightly off—By *K. W. Bennett.*

First quarter prospects for the storage tank industry are excellent. When an undercurrent of pessimism began to color the business outlook in some quarters, tank men remained silent. Understandably so. When a man finds a fishing hole that yields nothing less than 18-in. rainbows, he doesn't talk about how bad fishing has become.

Though cautious about 1954, most tank men feel that it will see only a slight decline below the booming output of 1953. Petroleum, chemical, and petrochemical industries are moving strongly for more tanks. First quarter tank fabricator bookings represent an excellent balance.

Besides these three basic industries, tank bookings for water condensing, construction, food and packing, distilleries, breweries, paint and varnish, and transport, are keeping the output well enough balanced to offset a drop in any one industry.

Can Get Materials

Coupled with this is a substantial easing in raw materials procurement. Hot-top plate, which practically vanished during the height of the Ordnance shell buying, began to ease in third quarter 1953 and is now readily available, according to major purchasers.

Though there has been talk of an approaching nickel shortage, nickel alloy plate has been readily available. Mentioning nickel bearing stainless steels brings mixed reactions. A few producers who don't use a great deal of nickel stainless and have a strong historical buying pattern aren't complaining. On the other hand, fabricators who employ a considerable amount of nickel stainless would like more.

Strip mill plate in 3/16-in. to 5-in. thickness, which began to pinch during second quarter 1953 and gave some trouble into third quarter 1953, is now moving freely, with extra tonnages being offered for 30-day delivery. With these growing stocks of steel, at least a cross section of major producers figure they'll handle as much tank tonnage in first quarter 1954 as they did in first quarter '53.

If anything is slowing up tank men on deliveries, it's wide-flange light structurals. This doesn't offer much hope before March—the earliest date at which much increase in available tonnage is expected.

With capital expansions currently keeping demand for heavy tanks at a solid pace, opportunities for tanks in the 10,000 to 30,000-gal capacity range are increasing. Though a few builders report that liquefied petroleum tank demand has fallen off somewhat, even down into the less-than-15,000-gal category, liquid ammonia and liquid nitrogen are beginning to get down to business.

Liquid ammonia production began a real boom in 1953. About 165,000 tons of plate were figured to have gone into ammonia tanks in 1953, with 220,000 tons calculated for 1954.

At least one producer will expand his output of tanks for the liquid nitrogen market, another soil fertility aid. Tanks for distribution purposes would be built. This producer has already put up a number, has been using aluminum rather than steel.

From at least two producers with a wide product mix, there are reports that municipal and state governments, along with their highway programs for 1954, are pushing for expanded public work on water purification projects that have been held up by a 3-year shortage of steel.

Backlogs Are Slipping

There are a few soft spots in the picture. First quarter is solid, but after that: liquefied petroleum gas, petrochemicals, petroleum, and chemicals might slow down, a few tank men say. The "might" is a big one. Petroleum has been theoretically headed for a slowdown for better than a year.

Slowdown hasn't arrived yet, orders are still coming in strongly from petroleum men who want tanks and want them either now or yesterday. L-P gas is slower, but it should be remembered that this relatively new fuel has been increasing in use by annual leaps.

Chemical and petrochemical are in the midst of capital expansion programs, and still have a distribution problem to solve.

Again, on the debit side of the picture—the tank backlog of orders has been falling since January. The "fat" began going out of orders in July. If a purchaser was at all in doubt about his future need for a tank he clipped it from the order. There has been some price slashing in light tanks. Backlogs are now described as "normal." If the speaker just had a cancellation, he'll probably say "nonexistent."

But the order books for first quarter are fairly solid, very well balanced. The sales force is out raising dustclouds on the backroads. The outlook: No boom, but good business.

Plate Shipments, All Grades

Period	net tons	Pct total shipments
1946	4,152,000	8.5
1947	6,345,000	10.1
1948	7,000,000	10.6
1949	5,759,000	9.9
1950	5,677,000	7.9
1951	7,911,000	10.0
1952	7,006,000	10.3
1953		
Jan.	713,791	10.1
Feb.	658,932	10.1
Mar.	707,296	9.5
Apr.	650,092	9.1
May	697,992	9.7
June	614,033	8.8
July	587,346	8.9
Aug.	585,510	9.0
Sept.	586,494	9.2
Oct.	644,317	9.6
10 months	6,424,294	9.4

NICKEL: Must Decide Now on Auto Trim

It's time to start tooling up for '55 models . . . Choice of chrome plate or stainless trim means different dies . . . Must predict still cloudy nickel future—By *R. D. Raddant.*

Automakers, and steelmakers to some extent, are trying to rub off some of the tarnish that still clings to the nickel situation months after decontrol.

For one thing, automakers are trying to do their best with what nickel is alloted them to improve their brightwork on current 1954 models. But looking farther ahead, they are not yet able to decide what 1955 trim will be plated and what will be chrome stainless steel.

The second problem is much more serious than it sounds. Some 1955 models may be out as early as July and certainly by August and September. The time for decision is at hand, but the uncertainty of nickel availability has held back this decision in some cases.

Wrong Guess Would Cost

Why must they make the choice so far ahead? One reason is that because of the different drawing properties, it requires a different die to make a straight chrome stainless steel part than a carbon steel part that will be plated. Another is the economy factor. A plated part is still cheaper to the automaker than stainless. Guessing wrong on nickel could be an expensive mistake.

Both steel people and automakers in Detroit agree that the International Nickel Co., which had to take on its shoulders the problem of allocating nickel after decontrol, has been very fair in its distribution. If there are exceptions to this opinion, they are a minority in this area.

However, there just isn't enough nickel to assure every auto manufacturer of the kind of brightwork he would like to have. Furthermore, civilian users of nickel received a 15 pct cut in allocations in January and have every reason to believe that another will follow in February.

One result is continued action by nickel users in premium nickel and high priced scrap The reductions in civilian allotments more than wiped out the easing effect of decontrol which added perhaps 5 to 10 pct to the available supply.

Reviewing controls, both amount and end use of nickel were under strict control. In the auto industry, nickel plating was restricted to a few functional mechanical parts and in trim to the bumper and door handles. On these permitted parts, the nickel was limited to not more than 0.001-in. thickness.

Trim Gets Nickel Now

Now the use of nickel is not under control, but it is still scarce enough in quantity to give brightwork specialists headaches trying to do a good job with what they have. While brightwork will be somewhat better this year, it won't be what any automaker would really like to make.

The big improvement is that nickel can be used in the plating of trim parts other than the bumper and door handles. For this reason, grilles should be brighter longer because some nickel will be used even if not what either the auto industry or the car buying public would like to have.

MOTOR-DRIVEN skis take the legwork out of uphill climbs.

There are differences in specifications for brightwork throughout the industry, but General Motors is probably representative. GM specifies for bumpers a total plating of 0.0015 in. Of this, not less than 0.0005 in. must be nickel with the balance copper, except for a chrome flashing with a microscopic thickness.

Less Brightwork in '54

Not all the industry specifies copper, believing it is satisfactory to plate the nickel directly to the steel if properly finished. However, this belief seems to be on the downtrend with the copper, nickel, chrome advocates generally predominating.

It is difficult to evaluate whether the average 1954 car will have more brightwork or less than 1953. It probably averages out to a little less for 1954, mostly because of reduction in splashy body trim rather than in grilles.

One of the most elaborate grilles will be on the Cadillac, but Cadillac spokesmen assured IRON AGE that no difficulty in maintaining satisfactory brightwork is expected. However, it goes without saying that any automaker would be foolish to permit his top quality product to suffer so this is not a fair evaluation of the industry.

New Plants Improved

A new factor to consider in the brightwork picture is the increasing amount of plating that automobile manufacturers intend to do in their own plants. In GM alone, Oldsmobile, Pontiac and Cadillac have new plating plants under construction.

These new plants probably will reflect more than anything the improvements in plating techniques that have been developed in the industry to improve automotive brightwork.

J. F. Wolfram, Oldsmobile general manager, explains that some of Oldsmobile's plating was so complicated that it was difficult to find outside sources that could do the job satisfactorily. He disclosed that in the past year his division had to resort to a West Coast source to plate Olds bumpers. It can be as-

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AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet

Subject: HOW GRANODRAW PHOSPHATE COATING FACILITATES COLD EXTRUSION OF STEEL

INTRODUCTION

By phosphate coating steel, prior to cold working it, extrusion, drawing, and other forming operations are greatly improved. In fact, it is the protective zinc phosphate coating that makes for the successful cold deformation of steel.

The tremendous pressures that most forming operations require produce extremely high frictional contact between die and metal. Without a protective coating, excessive galling (welding) of dies, breakage of tools, and unduly short die life will result. The combination of a non-metallic crystalline phosphate coating with an adsorbed lubricating film, possesses a low coefficient of friction while maintaining its stability under extremely high deforming pressures. This combination, therefore, greatly minimizes the aforementioned tool difficulties.

THE COLD EXTRUSION OF GENERATOR FRAMES

Cold extrusion is now being used advantageously in the manufacture of high production generator frames. This operation is facilitated by careful preparation and proper coating of the frame blank which is made from SAE 1010 open hearth plate steel.

After wheelabrating to remove the scale, the blank is rolled up and then fed automatically through a six stage dip wheel type washing machine which cleans the surface and applies the coating. The frame is then fed into an extrusion press where the wall thickness is increased on one end and reduced 47.5 percent on the other end. This operation produces concentric frames of uniform thickness and correct dimensions.

The Granodraw coating produces the proper surface to receive the lubricant by furnishing an extremely adherent film with the proper crystal size and continuity of coating required to insure maximum adsorbsion and tenacity by the lubricant. The lubricant, Montgomery DF 1101, is a combination of titre alkali soaps and resins. It is a powder which when dissolved in water and redeposited on the phosphate coated work piece, produces the necessary surface for subsequent operations. This film is dry and considerably less hydroscopic than similar coatings of the soap type. The concentrations of both the Granodraw and DF 1101 are maintained by simple chemical analysis.

PROTECTIVE COATING SEQUENCE

Stage	Operation	Chemical	Time	Temperature
1	Load and unload			
2	Cleaning	Tri-sodium phosphate and soda ash	1 Min.	180° F
3	Water rinse		1 Min.	180° F
4	Zinc phosphate coating	"Granodraw"*	4½ Min.	165° F to 180° F
5	Water rinse		2 Min.	180° F
6	Lubricating	H.A. Montgomery lubricant DF 1101	4½ Min.	190° F

*Trade Mark of the American Chemical Paint Company

CHEMICALS ACP PROCESSES

sumed that the other GM divisions have similar reasons for their plans.

Under the scarcity of nickel that platers have been saddled with since Korea, it is difficult to evaluate improvements in plating made by researchers. Steady gains have been made, however, even if circumstances don't give them an opportunity to show at full value.

Improvements have been made in the quality of nickel and in getting a nickel deposit that is not brittle and has fewer irregularities. Other improvements are traced to better knowledge of the finish on the metal before plating. Not so apparent to the customer, but to his benefit in the long run, are new techniques that permit better plating at a lower cost.

But nickel supply still holds the key. All the techniques in the world can't do the job if there isn't enough nickel around.

Small Firms Get More AF Dollars

Contract placements with small business concerns are growing, the Air Force says, pointing to a record of awards totaling $108.6 million between last July 1 and Nov. 1.

This total represents a 35 pct increase over the corresponding months of 1952. It does not, however, include the value of subcontracts placed with small firms.

"But I'm sure Mr. Jones would be interested in my new alloy."

MEDICINE: Bolster Industry Coverage?

House committee studying ways to lower treatment costs, provide more health safeguards . . . Administration believed to favor idea . . . AMA praises Ike—By R. M. Stroupe.

Medical care is becoming so expensive for the average citizen and his employer that a congressional committee this week resumed suspended hearings on proposals for lowering treatment costs while providing more adequate health safeguards.

House Commerce Committee, gathering testimony from industry, labor, the medical profession, and insurance groups, will continue its inquiry through Feb. 2. First begun in October, the study initially was concerned with the causes and control of major crippling and killing diseases.

Administration Sympathetic

Committee Chairman Charles A. Wolverton, R., N. J., says he intends to weigh the advisability of a program to help cover the heavy costs of caring for sick and injured persons. He finds "many of our labor unions and industrial concerns" have made "commendable progress" in handling this problem.

Mr. Wolverton believes the Administration is sympathetic to this idea because of President Eisenhower's statement last week that "medical costs are rising and already impose severe hardships on many families. The federal government can do many helpful things and still carefully avoid the socialization of medicine."

President Eisenhower's health plan which will be presented to Congress in detail in a special message on Jan. 18 also received some support from the American Medical Assn. Dr. Edward McCormick, AMA president, praised Mr. Eisenhower's rejection of socialized medicine but said he could not comment on the President's statement that "a limited government reinsurance service would permit the private and nonprofit insurance companies to offer broader protection. . . . "

Seeks Tax Deduction

Another of House Commerce Committee Chairman Wolverton's suggestions is that Congress consider permitting income tax deductions commensurate with investments in voluntary medical insurance programs or with the taxpayer's actual medical expenses. He also suggests examination of the possibility of:

(1) A law to permit the government to reinsure prepaid health plans of voluntary non-profit groups. (Mr. Eisenhower favors such reinsurance on a limited basis.)

(2) Government guarantees of private loans to stimulate building of hospitals and clinics.

(3) Plans to increase the number of students in medical and nursing schools.

(4) Methods of broadening the range of preventive medical and dental care.

Besides guiding the current inquiry, Mr. Wolverton is asking action on four bills (H. R. 6949, 6950, 6951, 6952) to provide low-cost medical services to a greater number. He submitted these bills as Congress reconvened and expects to introduce others outlining alternate recommendations.

First of the measures has the dual purpose of promoting the growth of non-profit health organizations and permitting protection against costs of extended illness.

A second provides that nonprofit groups offering prepaid medical-care plans be aided in getting required facilities and equipment by means of long-term, interest-bearing loans.

Another bill would make available mortgage-loan insurance to boost private investment in the building of self-supporting hospitals and related institutions. It also would open the way for extension of voluntary programs affording comprehensive medical treatment.

Cut Taxable Income

Reduction of taxable income of those with heavy medical expenses is the intent of the fourth bill. It would allow, in addition to deductions now authorized, a maximum subtraction of $100 for income tax purposes of payments into health insurance plans. This measure (H. R. 6952) has been referred to the Ways and Means Committee.

Work of the Wolverton committee recommended as Federal Trade Commission moved ahead in an all-out investigation of the health insurance business. FTC opened this inquiry after receiving complaints on misleading insurance advertising.

Fabricated Structural Steel

Contracts, Shipments, Backlog

Estimated Net Tons

	1953	1952	Avg. 1947-50
CONTRACTS CLOSED			
November	151,498	144,001	194,380
Year to Date	2,580,348	2,267,257	2,162,128
SHIPMENTS			
November	257,489	223,662	182,249
Year to Date	2,850,430	2,439,094	2,057,157
BACKLOG	1,804,079	2,357,351	1,407,149

Source: American Institute of Steel Construction

The Iron Age

INTERVIEWS.....

What's Ahead for Handling Equipment?

- Industry will continue to use more materials handling equipment for efficient, lower cost operation, predicts Sheldon K. Towson, president of Elwell-Parker Electric Co.
- Interviewed by Iron Age Cleveland Editor R. M. Lorz, Mr. Towson stressed that handling equipment often proves even more of a money-saver to small firms than to large ones.
- Sales outlook is competitive but strong, even if business generally declines slightly in 1954, he believes.

Sheldon K. Towson
President, Elwell-Parker Electric Co.

Q. What is the outlook for the purchase of capital goods and other costly equipment in 1954?

A. I feel that there may be a reluctance on the part of some people to buy new equipment in favor of making present equipment last a little longer. I do not think, however, that such a feeling will last for any great length of time. In any event, competition will be stiff in the months ahead, and it will mean that sales personnel will have to get out and really sell. Companies will have to expect increased sales resistance and give salesmen more backing than ever before.

Q. What part will materials handling equipment play in 1954's economy?

A. Materials handling equipment will undoubtedly play an important part in next year's economy. The country is growing and the population is growing. More and more goods will have to be handled and some mechanical means will have to be used to do the job as economically as possible. We can't go back to manual methods with their inherent increased costs, wasted time, and tremendous physical effort. We have to expand our materials handling equipment population just about as fast as our human population.

Q. If business does taper off generally, do you expect the sale of materials handling equipment to follow the same trend?

A. I believe I am safe in saying that the immediate reaction to a slump will be for business to embark on an all-out effort to reduce costs. And it goes without saying that materials handling equipment is one of the few remaining means of reducing such costs. Accordingly, at the start, the sale of materials handling equipment should hold its own and in some cases may increase. The tougher business gets, the more valuable such equipment will become. In the final analysis, therefore, I sincerely believe that the materials handling industry is in a position to offer positive help in lowering costs within industry in the highly competitive months ahead.

Q. What are latest developments in materials handling equipment?

A. Speaking for industrial trucks in particular, there have been no drastic changes in the design of such equipment in the last several years, and I see no sharp change in the future. I feel that some types of trucks have been overemphasized and that other types can do a more effective job. However, any company which buys an industrial truck today, a truck suited to its operations, will get just as much out of that vehicle 5 years from now. There will be no marked changes in truck design that will obsolete such equipment under future operating conditions—unless, of course, the company's product or entire operation changes markedly.

Q. What contribution do you think materials handling equipment will make towards safety in 1954?

A. The manufacturers of all types of handling equipment feel a strong obligation to the problem of safety. Every effort is expended in the designing of handling equipment to make its operation as safe as possible and to eliminate basic accident hazards inherent in manual handling. Manufacturers of industrial trucks, for example, have done an outstanding job in providing literature, films, etc., detailing every phase of safe operation of their equipment. I believe it is correct to say that materials handling equipment provides a positive means for reducing industrial accidents and thereby saving American business countless dollars. Replacement of manual handling

methods and their accompanying physical effort and strain by mechanical equipment has made a useful contribution to increased safety and increased output.

Q. What is the relation of materials handling equipment to big plants as against small plants?

A. There has always been a misconception that materials handling equipment is only for the big plant. This is definitely not true as thousands of smaller businesses have proved. In many instances, the savings obtained by smaller companies have been proportionately higher because inadequate handling is now so widespread. Small plants as well as big are fully aware of the economies of modern handling equipment. We do hope, however, that the first signs of tightened economy will not discourage companies with less resources from investing in handling equipment. Certainly, effective handling (and its accompanying lowered costs) is one positive means for such companies to remain competitive.

Q. What are your opinions on leasing versus purchase of materials handling equipment?

A. There is a sharp difference of opinion as to the method of obtaining materials handling equipment and the length of time it should be used before new equipment is obtained. For example, we are all familiar with the current emphasis on renting or leasing such equipment. In favor of such thinking is the fact that the user who never has any equity or an expectation of equity in his equipment may take a tax deduction equal to the total cost of its use. This arrangement can be advantageous if he is subject to the excess profits tax.

At the same time, low interest rates help finance the man who actually owns the equipment he rents or leases to others.

Another effect of the high tax, low interest combination is to make it economically possible to repair old equipment and keep it in service for longer periods. If a user can get the government to stand 80 pct of the cost of keeping old equipment going, he may often figure he is getting his money's worth out of the 20 pct he pays.

With the passing of the excess profits tax, however, we may witness some reversal of both of these trends. Some people who now lease equipment may find it more advantageous to purchase outright, and other users who now maintain old equipment at high cost may find it advantageous to scrap some of it and replace it with new. This is particularly true if we are allowed to set our own depreciation rates.

Q. What will be the philosophy of the industrial truck manufacturer in his sales efforts in 1954?

A. The man who buys an industrial truck next year is going to have to be a smart buyer. He is going to want the best truck possible for the money he has to spend. And it is going to be the job of every truck manufacturer to strive to make the best possible product at the most economical price. Key to the purchase of any industrial truck is the cost of its operation per ton mile. After all, a low original investment coupled with high maintenance and operating costs often is more wasteful than a higher original cost plus very much lower operating and maintenance expenses.

Handling Equipment Can Cut Costs

Mr. Towson: "The materials handling industry is in a position to offer positive help in lowering costs within industry in general in the competitive months ahead. This contribution, a role that will increase in importance as business becomes tougher and tougher, should mean continued success for an industry that has already stamped itself as an essential one in the field of increased production, reduced accidents, and better working conditions."

—Labor—

Can Strike:

Continental workers get 15¢ package, go back to jobs.

The 5 week strike of Continental Can Co. workers ended last week with a settlement slated to cost the firm 15¢ per hour. The 14,000 employees won a wage boost of 8½¢ per hour, retroactive to Oct. 1, 1953.

Of the remaining 6½¢, 3¢ will go immediately to reducing pay differentials between men and women and between workers at different plants, 2¢ more will be added for this purpose on Oct. 1, 1954 and 1½¢ will go for holiday and vacation benefits as of that date.

Likewise, the strike at American Can Co. ended early this week. Settlement was believed to have been along the same lines as the Continental agreement. Most of the American plants were expected to be in production this week.

Continental's contract ends Oct. 1, 1955, with wage negotiations to be reopened Oct. 1, 1954. General Lucius D. Clay, board chairman, stated, "This will eliminate from negotiations, during the wage reopening, all questions other than wage rates, group insurance and pensions."

Included in the terms are a clause on severance pay and provision for a joint company-union job evaluation program.

Wages at the 33 U. S. plants averaged $1.80 before the strike and at the three Canadian plants they averaged $1.50. The United Steelworkers had been seeking a 21¢ package.

Benefits for Laid-Off Workers

Republic Steel Corp. and United Steelworkers of America have agreed on extension of hospital and surgical benefits for wage-roll employees laid off temporarily.

The new agreement specifies that an employee laid off after Sept. 1, 1953, may continue hospital and surgical insurance for himself and his dependents by paying the monthly premiums until expiration of the present labor agreement.

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DEPRECIATION: Call

Study blames inflation, tax laws for $7 billion annual understatement of writeoffs.

Inflation and unrealistic tax laws are blamed in a depreciation study by the Machinery & Allied Products Institute for a $7 billion annual understatement of the rate of capital consumption. This amount must be reported as profits which are subject to income taxes.

Here are the findings of the organization's study:

More than $2.5 billion of the total underdepreciation results from currently required writeoff procedures. These understate the true cost of depreciation in the early years of service life. Productive equipment may be expected to lose about two-thirds of its value in the first half of its life. Loss on buildings and structures is reported slightly lower.

Inflation Costs $4.5 Billion

Most urgently needed tax reform called for by the group is correction of this by adoption of a double-rate declining-balance writeoff. Choice of either group or item accounting would be left optional. Should the government be unable to accept deferral of income tax revenue which would result, the association suggests the transition be made over the next few years in a gradual way.

Effects of inflation are felt to the extent of $4.5 billion annually. While prices have doubled in the past 10 years, Treasury Dept. regulations permit the basing of depreciation on original cost.

Would Adjust Base

The Machinery Institute estimates that if present regulations continue and no further inflation occurs, depreciation allowances on assets now in existence would fall short of replacement costs by as much as $70 billion.

Correction of this factor would be revaluing of original-cost book values through the use of an official set of multipliers to put them in terms of current dollars.

U. S. Laws Outmoded

In calling for these reforms, MAPI states that current tax depreciation policy is not only inequitable but also constitutes a dangerous drain on capital available for replenishment of productive capacity.

The study cites experiences of other nations in regard to both rate of amortization and monetary value adjustments to substantiate the observation that the U.S. has one of the most outmoded depreciation systems of any industrialized country in the world.

A summary of the study, which is soon to be published in book form, is available from the Machinery Institute.

Competition Spurs Instruments

Tightening competition in the coming year is expected to boost sales of instruments and control devices. That's the opinion of Henry F. Dever, president of Brown Instruments Div. of Minneapolis-Honeywell Regulator Co.

Automation, in cutting unit production costs, can provide a better competitive position for many manufacturing firms. Mr. Dever estimates that perhaps three-fourths of the manufacturing plants do not have the basic control instruments they need.

While he doesn't foresee any quick development of a true push-button plant, he did stress the importance of system engineering. This is a method of advance planning in which both factory and product are designed with regard to each other's needs.

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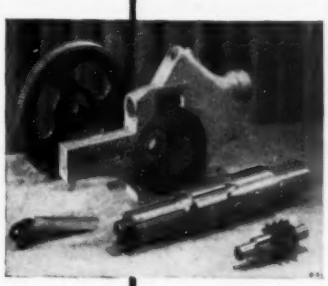

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How to Weed Out Character Risk Workers

◆ Maybe the man you're thinking of hiring has the skill, education to do the job—but will he do it well? Personnel expert McMurry urges industry to study both halves of worker: Ability and character.

◆ Most problem employees, outright failures are emotionally immature people. McMurry recommends planned interview technique to find them out before it's too late. How Patterned Interview works.

Your competitors would soon overwhelm you if you haphazardly installed machines, equipment without considering their capacity to produce or whether they were specifically fitted for the manufacturing process. Yet many plants hire men to run their machines, make company decisions, almost solely on the basis that their experience shows the ability to do the job but with no real inkling as to their character and will to do it well.

Dr. R. N. McMurry, of McMurry, Hamstra & Co., Chicago, urges personnel men to consider not only if job seeker *Can Do* the job but if he *Will Do* the job. The distinction here is that many potential employees have the education, aptitude, skills to do a specific job but nevertheless perform poorly because of basic flaws in character and personality.

Turnover Unstabilizing

Great preponderance of problem employees and outright industrial failures are the emotionally immature. Although they have attained physical and intellectual adulthood, these men and women have not had an accompanying growth in the ability to act and think in an adult way.

Employee turnover is unstabilizing, robs you of your training investment in men. When the wrong man works for you, productivity suffers, bad morale spreads, customer relations are impaired.

Dr. McMurry's system of personnel selection stresses thorough and meaningful probing into an applicant's background, job performance to determine if he has the skills to do the job and the character traits and emotional maturity to work well.

Most personnel procedures worthy of the name ascertain pertinent facts of an applicant's history, make some effort to determine soundness of character. What often minimizes the effectiveness of some personnel systems is absence of a disciplined method to root out and evaluate personality assets or flaws.

Before placing your want ad in the local newspaper, it is necessary to evolve a set of man specifications demanded by the specific job. These include skill requirements, experience, background, and any personality traits deemed essential. What may help you evolve job specifications is a study of men presently employed to detect the difference between fit and unfit.

After the first step of "window screening" applicants to weed out the grossly unsuitable, the application blank is filled out, giving complete personal information. From this the personnel man eliminates the obviously unqualified. If he has intelligence or proficiency tests he may wish to give them to the survivors.

Numerically slimmed by now, the applicants undergo the important telephone check and other verification of statements. The personnel man phones previous employers and checks the veracity of experience claims. During these calls, the personnel man picks up clues as to character and asks: "Would you hire this man again?"

Now the applicants enter the last lap—the McMurry Patterned Interview. With a special form detailing all the questions in black type and possible interpretations, hints on what to look for in red, the interviewer begins a conversational probe into the job-seeker's personal and job experience. How thorough the hunt for facts may depend on the importance of the job.

Aim of the Patterned Interview is to give the personnel man a close acquaintanceship with the applicant before his company learns about him the hard way. Crux of the system is the premise that the pattern of a man's future accomplishment can best be found in what he has done in his past.

6-Area Interview

The fixed questions and procedure eliminate purposeless interviewing, offset personal prejudice and bias of the interviewer. Also offered is a set of principles with which to interpret findings.

Into six areas the interview flows: work history, education and training, family background, financial situation, domestic and social relations, health record.

Once the interviewer has full facts, he can begin to make a final overall appraisal of the applicant's qualifications.

Being careful to match the applicant's assets and shortcomings only against the previously established specifications for the job, the interviewer finally recommends whether the man should be rejected or hired. His decision derives from evaluation of Can Do and the following Will Do factors.

Importance of character traits, motivation, emotional maturity vary widely from job to job. The interpretation depends on common sense judgment rather than any

Training Conference

Dr. Robert N. McMurry, nationally recognized authority in the personnel selection field, of McMurry, Hamstra & Co., is giving a series of training conferences in four major cities across the country. The conferences are being held in conjunction with Dartnell Corp., Chicago. To write this story, Iron Age's T. Metaxas attended the conference held in New York last month.

slide rule technique. Dr. McMurry recommends that personnel men regard these basic habit patterns as important to the performance of any job: Stability, industry, perseverance, loyalty, self-reliance, ability to get along with others, leadership and competitiveness.

For the first of these character traits, stability, the Patterned Interview questions seek to discover whether the applicant is a good long-term job prospect or a job hopper. Did he scatter his energies among many activities in school? Did he transfer from college to college? Has he stayed true to his hobbies or to the same wife? Other habit patterns follow:

Industry—the extent to which a man will work steadily, productively, voluntarily. Has the applicant worked steadily and continuously, made progress, gotten raises?

Perseverance — will the applicant conquer obstacles and persist to accomplish the job? Has he graduated, stayed on the difficult jobs?

Loyalty—will he subordinate his own interests to those of the employer, go beyond ordinary requirements to serve his firm?

Self-Reliance — does the applicant do things for himself rather than depend on others? Has he solved his own problems, found his own jobs, become self-supporting at an early age?

Ability to get along with others —can the applicant maintain good relationships with his fellow workers? How did he get along on other jobs? Did he like the people he worked with, enjoy group activity?

Leadership—can he inspire confidence and trust in others so they will seek his guidance? Is he capable of supervising?

Competitiveness—does he want to compete with and surpass others?

The interviewer also rates the applicant on the crucial personality area of emotional maturity. Traits which are evaluated include: Dependence, selfishness, pleasure mindedness, disregard for consequences, wishful thinking, show-off tendencies, lack of self-discipline and self-control, refusal to accept responsibility.

Because everyone shows some degree of emotional immaturity, the interviewer must determine whether the type and extent displayed by the applicant will seriously handicap him in the specific job for which he is being considered, or limit the extent of his future usefulness. In digging for signs of immaturity the interviewer must be aware that the "childish" person has often developed an artful camouflage for shortcomings.

When the interviewer bases his conclusions on facts rather than excuses, he has withdrawn from dangerous ground. "Has done" is of more vital importance than "why it was done."

The third Will Do area of rating is *motivation*, or the ability to work hard and successfully because of certain needs, drives, or reasons for ambition. These motivations are listed by Dr. McMurry as the needs for economic security, recognition, understanding of a subject or job, the need to excel, achieve, acquire, serve.

Look for consistent evidence of an applicant's motivating needs and whether they are being satisfied in his job or through social and outside activity. If an applicant has a strong need to work he can be regarded as desirably motivated.

Dr. McMurry suggests that a definite deficiency in a character trait deemed essential to performance of the job in question should automatically disqualify a worker.

When the interview has ended, the personnel man is ready to proceed to a rating form entitled "Selection and Evaluation Summary." On this appear numerous Can Do factors ranging from appearance to intelligence and Will Do factors including character traits, motivation, degree of emotional maturity. For each factor he rates the man either as outstanding, good, marginal, poor.

At the bottom of the form is room for the overall rating:

(1) Outstanding, possessing all qualifications with practically no handicaps.

(2) Well qualified but not outstanding, in which the applicant can do the job but displays a slight deficiency in one of the necessary character traits.

(3) Marginally qualified, where there is some doubt he can do the job and is definitely deficient in one job-necessary character trait or somewhat deficient in several. The applicant is also slightly lacking in motivation.

(4) Unqualified, where he cannot do the job and is a very poor character risk.

Those falling in classes 1 and 2 can be hired with reasonable safety. Those in category 3 are risks who should be hired only if needs are pressing. The 4's should never be hired.

What Tests to Use in Hiring

Dr. McMurry believes personality, skill and aptitude tests can be valuable supplements to personnel selection but must be subordinated to the skillful interviewing and interpretation of findings by the personnel man.

An intelligence test should most definitely be used to determine mental ability, problem solving and learning potential. For some repetitive jobs, very high intelligence can be a liability, for others an asset. High intelligence does not automatically indicate emotional maturity.

Tests of vocational interest serve best in the vocational counseling field where there is no large incentive to fake or slant answers.

Proficiency and skills tests, aptitude and unlearned skills tests are recommended—but they should be validated. By validation, Dr. McMurry means checking the tests through to confirm relationship of performance on test to actual performance results on your specific job. Draw a line across the score below which most job performance failures occur.

Paper and pencil personality makeup tests may be sound when used in vocational counseling, but they too can be faked.

Railroads:

Seek lower freight rates to meet truck competition.

The railroads are pulling out all the stops in their battle to regain iron and steel shipping lost to truckers.

Latest move is a proposal by the Traffic Executive Assn., Eastern Railroads, that would install motor competitive scales averaging 18 to 20 pct under present rates in eastern territory. The proposal will be submitted to the Interstate Commerce Commission some time late in January.

Cover More Products

After that, the railroads will consider proposals made by steel shippers and consumers at a Pittsburgh hearing (THE IRON AGE, Jan. 7, 1954, p. 248) that the list of products covered by the lower rates be broadened. Some shippers have proposed inclusion of semi-finished since in a few instances the proposed scale is lower than the semi-finished rate.

Late last year the railroads put into effect motor competitive rates for iron and steel products moving in southern territory and on shipments moving from the East into southern territories as well.

Army Slashes Truck Orders

Anticipated savings of about $140 million are involved in the Army decision last week to cancel more than half its orders for certain types of trucks and one-third of its scheduled procurement of specialized trailers.

Affected by the cutback is the production by six companies of jeeps, ¾-ton and 2½-ton trucks, 1½-ton cargo trailers, and 1½-ton water trailers. Termination date of contracts for these vehicles is set for "near the middle" of this year.

Its action, the Army says, is in line with the policy of reducing procurement to fit its "reduced strength." Army, Navy, and Marine Corps are to have fewer personnel, while Air Force strength will be boosted during the next few years.

Companies which will produce less than 50 pct of trucks previously ordered are:

General Motors Corp. and Reo Motors Corp., manufacturers of 2½-ton trucks.

Willys Motors Inc., jeep producers.

Dodge Div. of Chrysler Corp., Manufacturers of ¾-ton trucks.

Orders for 1½-ton cargo trailers made by Checker Cab Co., and 1½-ton water trailers produced by Fruehauf Trailer Co., were cut by one-third.

The Army says "it appears" it will not have to cancel orders for 5-ton trucks at present.

Delay Launching Big Carrier

Late delivery of main engines and other "major equipment" is responsible for postponement of the launching of the giant aircraft carrier Forrestal until fall, the Navy says.

Progress on construction of the 60,000-ton vessel being built at Newport News, Va., is described as "quite satisfactory." Work on the second deck is well along, and the hangar deck, immediately below the flight deck, has been started.

A second vessel of the same class, the Saratoga, is being built at the Brooklyn, N. Y., Navy Yard. Deadline for Navy acceptance of bids on construction of a third giant carrier passed last week.

Brookhaven to Get Synchrotron

Design work will begin soon on a 25-billion-volt particle accelerator for nuclear research, to be built at Brookhaven National Laboratory, Upton, L. I.

Described as an alternating gradient synchrotron, the new machine will use alternate strongly converging and diverging magnetic fields to confine a proton beam in a relatively small cross-section tube. This action permits production of high-energy beams with smaller electromagnets and related equipment.

Atomic Energy Commission, which has approved design and construction of the accelerator, estimates cost of the project at $20 million. Completion may require 5 to 6 years.

Once in operation, the machine will be available to collaborating and independent scientists.

IRON & STEEL: November Output By Districts

As Reported to the American Iron and Steel Institute

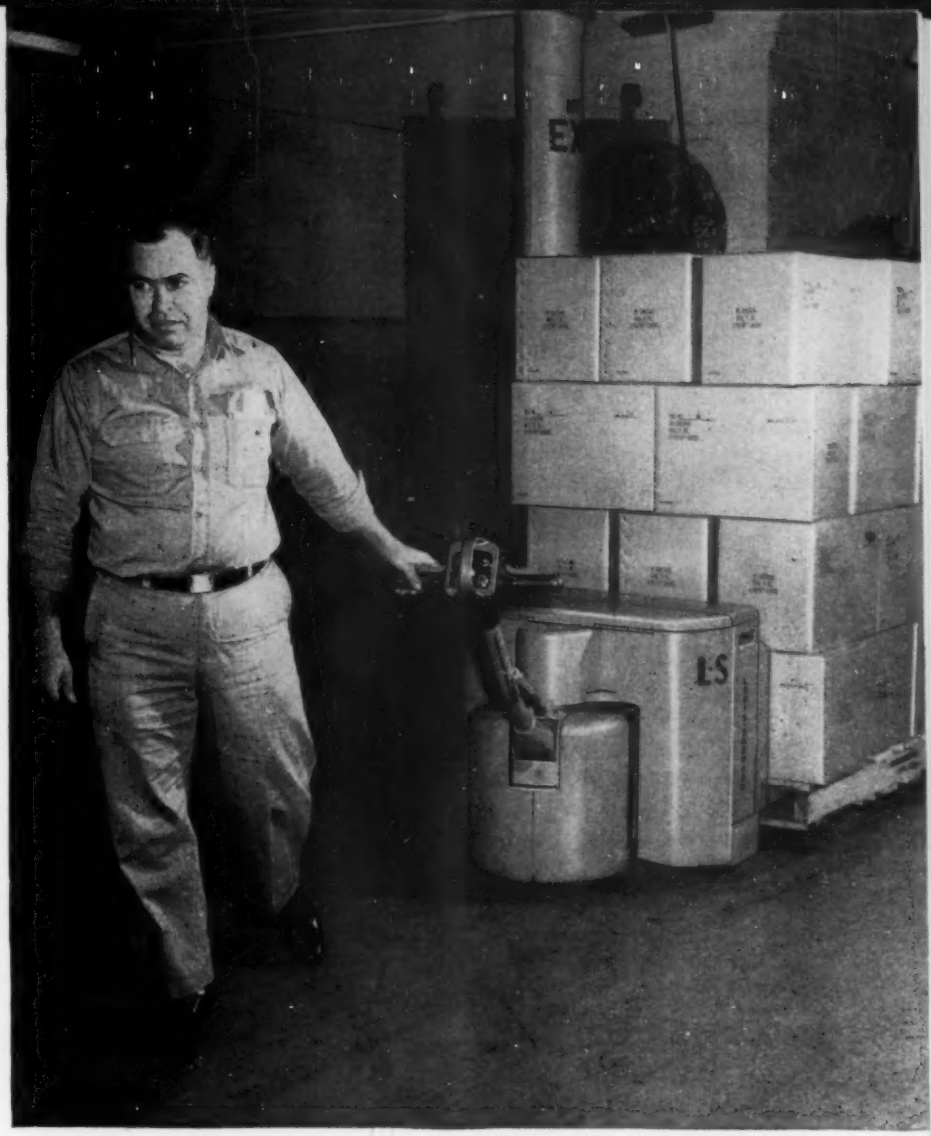
BLAST FURNACE —NET TONS DISTRICTS	Annual Capacity	PIG IRON Nov.	PIG IRON Year to Date	FERROMANG., SPIEGEL & SILVERY IRON Nov.	FERROMANG., SPIEGEL & SILVERY IRON Year to Date	TOTAL Nov.	TOTAL Year to Date	Pct of Capacity Nov.	Pct of Capacity Year to Date
Eastern	16,312,990	1,276,810	13,558,709	15,995	294,239	1,292,805	13,852,948	96.3	92.8
Pitts.-Yngstn.	28,643,120	2,016,704	24,899,663	40,844	386,793	2,057,548	25,286,456	87.3	96.5
Cleve.-Detroit	8,633,800	686,327	7,752,457			686,327	7,752,457	96.6	98.1
Chicago	16,251,250	1,262,944	14,378,340	1,158	23,686	1,264,102	14,402,026	94.5	96.8
Southern	6,020,380	440,015	5,108,175	4,899	84,418	444,914	5,192,593	89.8	94.2
Western	3,518,700	316,904	3,577,439			316,904	3,577,439	109.5	111.1
TOTAL	79,380,240	5,999,704	69,274,783	62,896	789,136	6,062,600	70,063,919	92.8	96.4

STEEL —NET TONS DISTRICTS	Annual Capacity	TOTAL STEEL* Nov.	TOTAL STEEL* Year to Date	Pct of Capacity Nov.	Pct of Capacity Year to Date	ALLOY STEEL Nov.	ALLOY STEEL Year to Date	HOT TOPPED CARBON INGOTS Nov.	HOT TOPPED CARBON INGOTS Year to Date
Eastern	23,863,810	1,911,343	20,935,563	97.3	95.9	94,804	1,616,735	303,583	4,054,994
Pitts.-Yngstn.	43,621,000	2,942,261	38,189,718	82.0	95.7	329,763	5,540,719	327,841	†4,813,144
Cleve.-Detroit	12,002,900	918,272	10,407,821	93.0	94.7	49,360	831,660	62,913	900,668
Chicago	24,960,600	1,942,193	22,575,812	94.6	98.8	95,958	1,528,729	290,831	3,441,026
Southern	6,036,160	491,091	5,341,138	98.9	96.7	2,151	49,239	5,028	61,787
Western	7,063,000	484,946	6,213,393	83.4	96.1	4,940	117,373	19,802	287,334
TOTAL	117,547,470	8,690,106	103,663,445	89.9	96.4	576,976	9,684,455	999,998	†13,558,953

* Includes Alloy Steel, Hot Topped Carbon Ingots. † Revised.

Gillette

Insures "Super-Speed" deliveries with Lewis-Shepard Trucks



It's a staggering job — keeping the men of America supplied with Gillette Super-Speed Razors, Shaving Cream . . . and millions of smooth-shaving Gillette Blue Blades a month. Yet the Gillette Safety Razor Company's Shipping Department beats this challenge every time — and insures "Super-Speed" deliveries—with considerable help from a fleet of super-dependable L-S Materials Handling Trucks!

Cost-shaving dependability — One big reason for Gillette's use of L-S Trucks is their outstanding maintenance records. Here are the facts!

With 10 L-S electrics in operation throughout the plant, records for a recent 12 month period (10,400 truck hours) reveal only 39½ hours total downtime for other than routine service. In other words, each truck averaged less than 4 hours of out-of-service time per year. The total cost for parts during the same period was less than $5 per truck. That's dependability!

Here's what Gillette found — (and you will too) about the unique L-S operating controls on the JackLift Electric Walkie pictured here: *All* controls, are within easy fingertip reach on the handle head (inset). All controls, including the electric brake, operate with the handle in any position.

The results are faster, safer operation and far greater cramped-area maneuverability. Furthermore, the handle is balanced to minimize operator's arm strain during hauls.

You, too, can enjoy these L-S advantages! No matter what you handle — cornflakes or castings — there's an L-S Truck designed to fit your needs . . . *exactly*. Learn about the dollar-pinching dependability of L-S Materials Handling Trucks. Write us or call your local L-S Representative, listed under "Trucks, Industrial" in your Yellow Phone Book.

Exclusive also are the L-S Booster Rollers . . . an engineered feature to make pallet entry and exit smoother, without damage to pallet boards.

Happy Customers

Listed are some current L-S reorders from "bluechip" companies in various industries

Motor Car	45 L-S in use—reordered	2
Grocery Chain	73 L-S in use—reordered	6
Chemical	14 L-S in use—reordered	5
Elec. Goods	194 L-S in use—reordered	14
Carbon Mfr.	23 L-S in use—reordered	4
Mfg. Chemicals	74 L-S in use—reordered	6
Glass Mfr.	12 L-S in use—reordered	2
Rubber Goods	5 L-S in use—reordered	3

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Please send me

- ☐ Proof Folders
- ☐ Electric Truck Comparison Charts

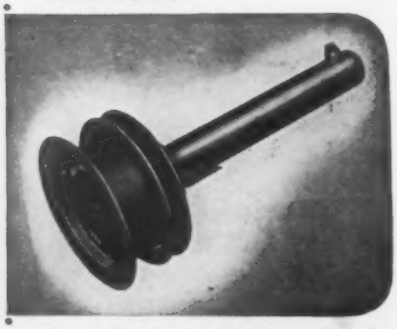
Name .....

Company .....

Address .....

City ..... State .....

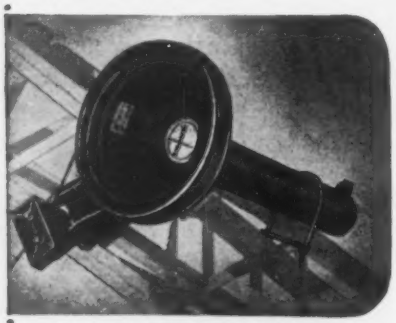
2 ways to make crane operations pay more



Rud-O-Matic Magnet Reel Tagline Combination

Steel tagline holds magnet steady and absorbs the load . . . protective slack is maintained in expensive magnet cable to avoid jerking, pulling loose at the terminals or snagging.

Standard with major crane manufacturers, made in five sizes for your present equipment.



Rud-O-Matic Tagline

steadies your clamshell buckets. Provides ample coil spring power at all boom angles to keep bucket lined up with the work. Makes more loads per day easier. Rud-O-Matics are foolproof, trouble-free. Eight sizes meet all requirements. Available immediately. *For full information see your dealer—or mail coupon below.*

I'd like more information on ☐ Rud-O-Matic Taglines, ☐ Rud-O-Matic Magnet Reel-Tagline Combinations. Send literature and complete details.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

McCAFFREY-RUDDOCK Tagline CORPORATION

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Industrial Briefs

Back Home . . . John E. Kelly, consultant in natural resources, Washington, has just returned from a 2-month study of export possibilities of Spanish minerals including iron ore and pyrites.

Relocated . . . DRAVO CORP., Machinery Div. moved its Cleveland office last month to 4207 Chester Ave.

Coast to Coast . . . SOLAR STEEL CORP., Cleveland, has purchased the warehousing operations of Rawlins Bros., Inc., Los Angeles, and has extended its steel warehousing service coast to coast.

Setting Records . . . INDIANA HARBOR WORKS, of Inland Steel Co., set seventy-nine new annual records to make 1953 the biggest production year in the plant's 51 years of operation.

Sales Rep. . . . ADAMAS CARBIDE CORP., Harrison, N. J., has appointed D. A. Olson Co., Seattle, as its sales representative for the States of Washington and Oregon.

Spanish Plant . . . ALUMINUM LIMITED, Montreal, has started construction of a new fabricating plant in Alicante, Spain. The plant is owned by Aluminio Iberico, S.A.

New Chairman . . . CONTROLLERS INSTITUTE OF AMERICA has appointed Wayland S. Bowser, controller, Blaw-Knox Co., Pittsburgh, chairman of its Social Security Committee.

Declare Dividend . . . BALDWIN-LIMA-HAMILTON CORP. board of directors declared a quarterly dividend of 20¢ per share on the common stock, payable Jan. 30, 1954.

Enters Field . . . HERCULES POWDER CO., Wilmington, has entered into the miracle fiber field and plans to build a new plant at Burlington, N. J.

First Prize . . . THE AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS, New York Section, has awarded first prize for scientific papers from regional engineering students to David J. Barnette, and Paul Farrar, of New York University's College of Engineering.

New High . . . AMERICAN SOCIETY OF TOOL ENGINEERS membership hit a new high of 28,006 as of Dec. 31, 1953. This is an increase of 4,015 over the 23,989 membership figure for 1952.

New Division . . . EATON MFG. CO., Cleveland, reports that Dynamatic Corp., Kenosha, Wis., became a division at the end of 1953. It has formerly operated as a subsidiary but will now be the Dynamatic Div. of Eaton.

Elbow Room . . . ZIEGLER STEEL SERVICE CORP., Los Angeles, reports the third major expansion of the company, which doubles in size the Los Angeles Division plant and office.

Summer Study . . . GENERAL ELECTRIC CO. has granted fellowships for six weeks of expense-free study next summer to two hundred high school science and mathematics teachers from 24 states.

Gets Contract . . . ALAN WOOD STEEL CO. has awarded a contract to George J. Hagan Co., Pittsburgh, for a 55 ft. rotary hearth slab heating furnace for its plate mill at Conshohocken, Pa.

Prefab Piping . . . BLAW-KNOX CO., Pittsburgh, has received an order for 1,240 tons of prefabricated piping from the Atomic Energy Commission for use in the new gaseous diffusion plant being built for the AEC at Portsmouth, Ohio.

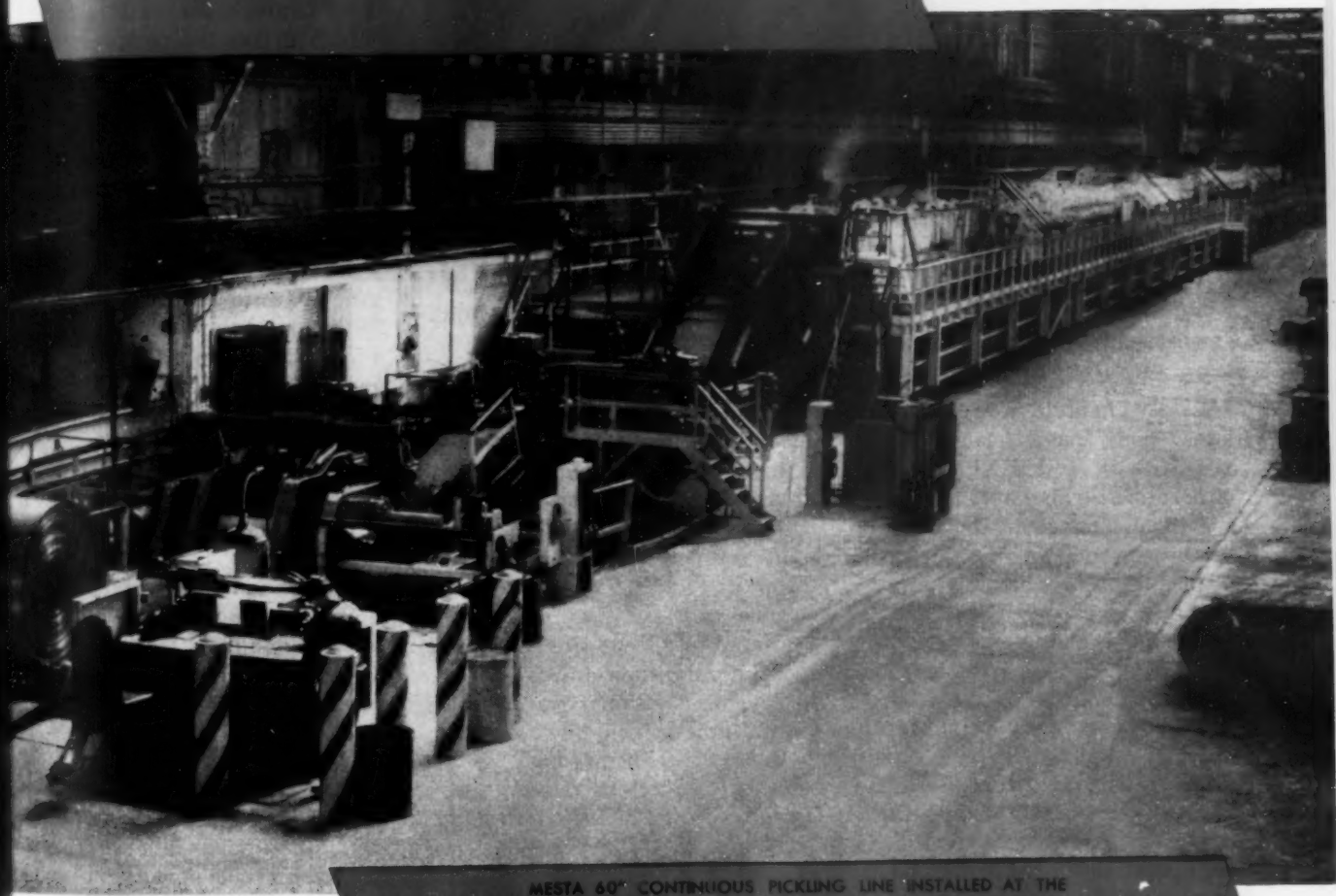
Purchased . . . MAGNESIUM CO. OF AMERICA, East Chicago, Ind., has purchased the Tobey Mfg. Corp., El Segundo, Calif. Michael Neushul, will be vice-president and manager of the new Division.

Expansion . . . MACKINTOSH-HEMPHILL CO., Pittsburgh, reports a quarter-million dollar expansion program for its Midland, Pa., foundry.

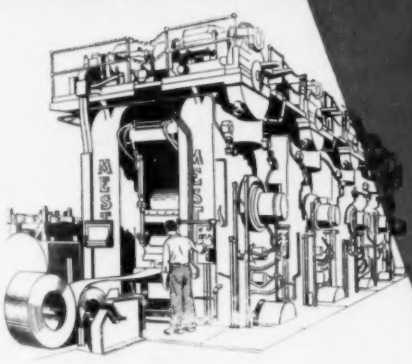
New Post . . . NATIONAL TOOL & DIE MANUFACTURERS ASSN. has appointed Charles R. Bender assistant secretary, with headquarters in Cleveland.

Hear Ye . . . WORTHINGTON CORP., Harrison, N. J., reports the joint incorporation of a new Japanese-American company under the name Niigata Worthington Co. Ltd.

MESTA
HIGH-SPEED CONTINUOUS PICKLING LINES



MESTA 60" CONTINUOUS PICKLING LINE INSTALLED AT THE INDIANA HARBOR WORKS OF THE INLAND STEEL COMPANY

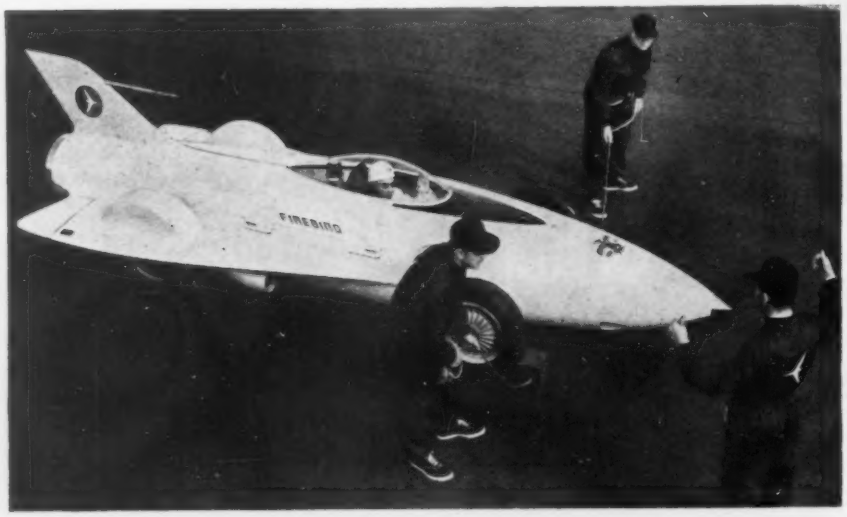


AFTER PICKLING, COILS OF STRIP STEEL ARE COLD ROLLED ON A MESTA HIGH-SPEED TANDEM COLD MILL

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

Pittsburgh, Pa.



GM Turbine-Powered Firebird Takes Off

Experimental car follows aerodynamic design . . . It even has wing flaps . . . New alloys went into 370-hp kerosine-burning turbine . . . But you may never drive it—*By R. D. Raddant.*

A new chapter in automotive history may have been opened with General Motors' showing of the first gas turbine automobile to be built and tested in the U. S.

Although GM was particularly cautious to point out the purely experimental nature of the XP-21 Firebird, as the single seater with the delta wing effect is called, its possible importance to the future of the industry can't be ignored.

This is particularly true when backed by the fact that Ford is also working intently on gas turbines and a gas turbine truck has been operating on the West Coast over a year.

Why GM Built It . . . GM's president, Harlow H. Curtice, was a long way from going out on a limb when he stated:

"Possibly this is a development along a road we may not wish to go, so far as passenger automobiles are concerned. We built the Firebird to help us explore commercial possibilities of the gas turbine and add to our knowledge of thermodynamics."

So much for the philosophy. What kind of a power plant does it have? Are the drawbacks too great? What original work in the way of metallurgy and design went into it? What is its performance?

Some of these questions aren't answered readily. For example, speed, acceleration and other performance characteristics are still secret. It is known, however, that it was not really opened up in tests at GM Proving Ground near Detroit nor at the Desert Proving Ground at Phoenix.

High Power to Weight . . . The Whirlfire engine develops 370 hp when the gasifier turbine is at 26,000 rpm and the power turbine is revolving at 13,000 rpm. Total weight of the engine unit, including gasifier and power sections, is 775 lb against an overall weight of the car of 2500 lb. This gives the powerplant and drive a weight to power ratio of about 2 lb per hp, about one-third that of a piston engine and drive.

The two parts of the engine are the gasifier section and power section. The gasifier section consists of a compressor rotor and a gasifier turbine wheel, both attached to the same shaft. Air entering the compressor is raised to more than 3½ times atmospheric pressure before it enters the two combustion chambers.

Kerosine is burned in these chambers, raising the gas temperature to 1500°F. The hot gas goes through the gasifier turbine which drives the compressor and the blast from the gasifier turbine is funneled to the second turbine, the power section turbine. This is connected with the car's rear wheels through a two-speed transmission.

Has Plastic Body . . . Entire engine fits into a space 63 in. long, 26 in. deep and 32 in. wide. The Firebird's overall length is 222.7 in. and its width is 80 in. at its widest part. It is only 41 in. high at the top of the plastic bubble over the driver's cockpit and 55 in. high at the top of the rear vertical fin. Wheelbase of the XP-21 is 100 in.

The glass fiber reinforced plastic body, with its needle nose, delta wings and vertical tailfin, was designed by Harley J. Earl, vice-president in charge of styling staff. Engine and chassis were developed under the direction of Charles L. McCuen, general manager of the Research Laboratories Div. Mr. McCuen almost lost his life in an accident test driving the car. (See THE IRON AGE, Oct. 29, 1953, p. 61.)

Uses Flaps, Too . . . A 35-gal fuel tank is in the nose while the engine is in the rear. Brake drums are outside the wheels to facilitate rapid cooling. The wings have functional brake flaps controlled from the steering wheel.

Suspension is called a double wishbone front suspension with torsion bar spring. The rear is a deDion type with the axle sus-

pended with a single leaf spring with a "walking beam" stabilizer unit included in the assembly.

Metallurgists played a prominent part in the engine development, creating new alloys to stand up under the high temperature and speeds demanded of some of the parts.

Develop New Alloys . . . Turbine buckets for gasifier and power turbines were made from a new super high temperature alloy designated as GMR-235 developed in the Laboratories' metallurgy department. They are precision cast by the lost wax investment process. Nozzle diaphragms are shell molded from another new alloy, GMR-426W.

Major drawback of the engine is the high fuel consumption, several times greater than a conventional engine. In spite of the impractical nature of the first car, there are some assets that indicate the gas turbine will be fully explored.

Detroit Notebook

Ford's new Special Products Div. is now asking for prices on parts for the new car it expects to introduce in 1955. Presumably, it will be a revival of the Continental, an exclusive luxury model at the top of the price class. Those who have seen drawings of the tentative body styling report it is long and low, with a flat hood surface and somewhat vertical lines. "Not flash, but class," is the way one person put it.

Lincoln-Mercury has $13 million earmarked for new expenditures and plant equipment to continue expansion of this Ford Motor Co. division in 1954. Most of it will go to assembly plants to increase capacity and efficiency.

The Automobile Manufacturers Assn. has formed a technical study group to investigate possible effects of automotive exhaust gases on air pollution. The group, headed by John M. Campbell, administrative director of the GM Research Laboratories, will seek answers to the possibility of exhaust gases contributing to air pollution and smog, extent, and possible solution.

Nash plans a late March introduction of a new car that will sell under $2000 and obtain up to 40 miles per gal, according to a letter to stockholders from Nash-Kelvinator president George W. Mason.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Jan. 9, 1954..	126,696*	27,433*
Jan. 2, 1954..	72,903	20,390
Jan. 10, 1953..	109,880	29,740
Jan. 3, 1953..	82,539	23,563
ANNUAL TOTALS		
1953	6,511,100	1,318,430
1952	4,622,109	1,367,400

*Estimated. Source: *Ward's Reports*

New Models:

Buick '54 styles hint changes set for Cadillac, Oldsmobile

In the post-holiday week two more new cars made their showroom appearances, the 1954 Buick and Ford.

Biggest news about the Ford, which retained most of its 1953 styling, is the new Y-block V-8 engine (See THE IRON AGE, Dec. 31, 1953, p. 34). Second principal new Ford feature is a ball-joint front end suspension.

Buick made news on several fronts, notably styling. As the first of GM's top three divisions, all of which are completely restyled for 1954, Buick's introduction is a preview of the degree of change that can be expected in Cadillac and Oldsmobile.

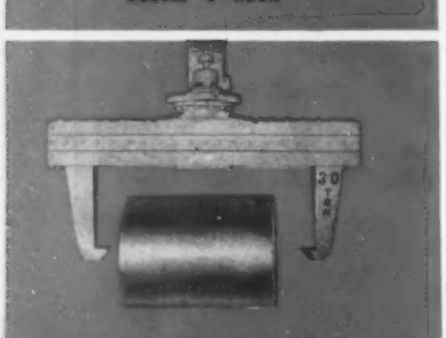
Outstanding is the wrap-around or "panoramic" windshield which goes a long way toward changing the entire body line of the car. This is due to the vertical or reverse slant, depending on the model, of the forward body posts.

Buick also re-introduced an old line, the Century, which will be one of the hottest cars on the road. This will have the body size of the smaller Special and the 200-hp engine of the Roadmaster.

THE BULL OF THE WOODS By J. R. Williams

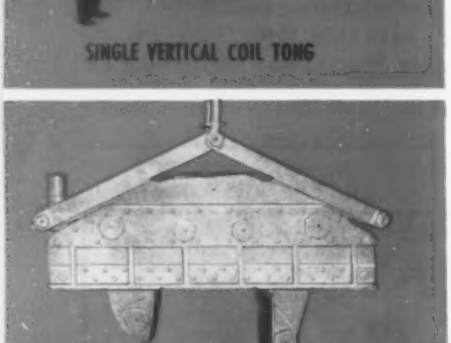
PUT THEM GEAR COVERS ON TH' FLOOR! YOU'LL HAVE EVERY OLD FOSSIL AROUND DROPPIN' BY TO ASK IF WE'RE PUTTIN' MORE BABY GUARDS ON TH' MACHINES--THERE'S ONE NOW!
NOTHIN' KIN SURPRISE ME NO MORE--HA HA!
THEY'RE REPAIRIN' TH' LATHE NEXT TO TH' VACANT ONE, AN' THAT GUY'S GREEN ER HE'D NEVER GIVE 'EM A CHANCE LIKE THAT!
1-15
J.R.WILLIAMS
THE OPENING
Copr. 1954 by NEA Service, Inc. T. M. Reg. U. S. Pat. Off.

DOUBLE "C" HOOK

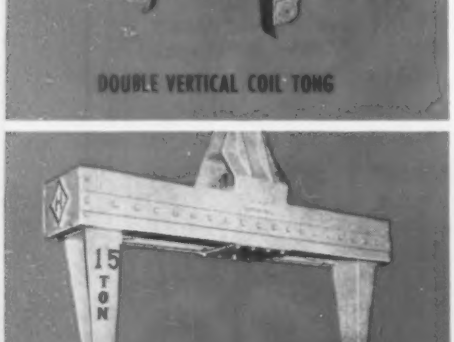


MOTORIZED ROTATING HORIZONTAL COIL TONG

SINGLE VERTICAL COIL TONG

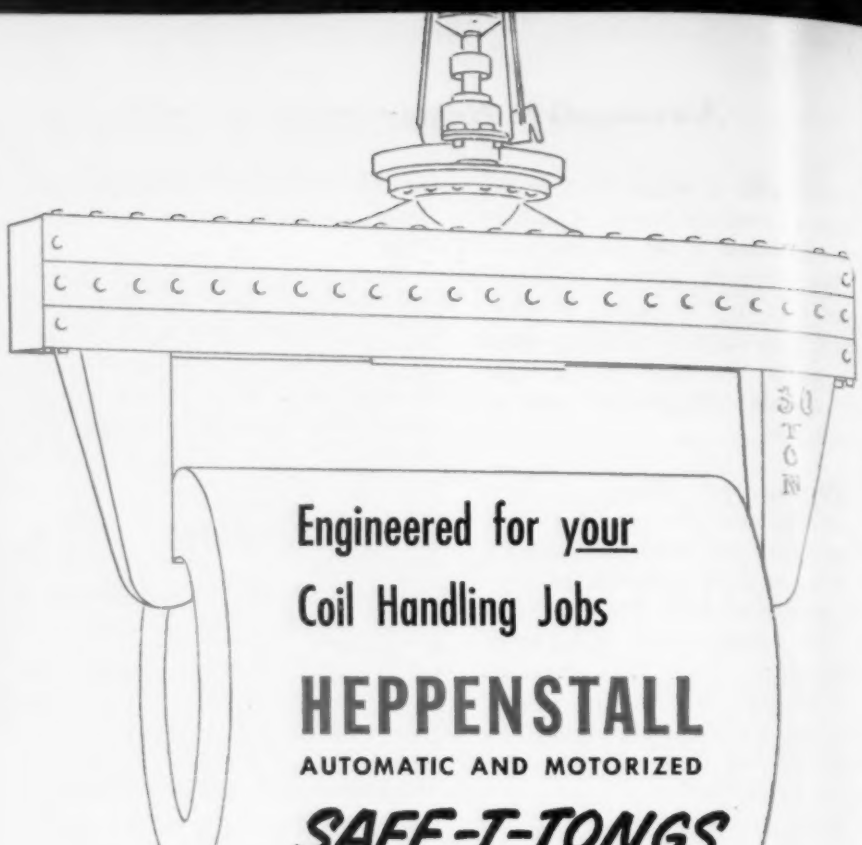


DOUBLE VERTICAL COIL TONG



OTORIZED NON-ROTATING HORIZONTAL COIL TONG

HORIZONTAL COIL TONG OVER ENDS



Engineered for your Coil Handling Jobs

HEPPENSTALL

AUTOMATIC AND MOTORIZED

SAFE-T-TONGS

Coil handling problems differ from one plant to another. And Heppenstall's Safe-T-Tongs are designed to fit each set of specific requirements . . . *yours* for instance.

Heppenstall's Safe-T-Tongs (for coils) are lifting steel strip weighing up to 35 tons per coil—safely and economically. They are designed to lift coils vertically or horizontally—or grasp coils circumferentially as required.

Heppenstall Safe-T-Tongs for coil handling jobs have stepped up efficiency—lowered overall costs—decreased damage to coils—and improved safety conditions in plant after plant. They'll do the same for you.

Our engineers would like to work with you in designing tongs to meet *your* specific requirements. Write us today.

You'll want this new catalog. It contains solutions to many materials handling problems. We'll be pleased to send you a copy. Address: Heppenstall Company, Pittsburgh 1, Pa.

TONGS TO LIFT COIL HORIZONTAL AROUND O.D.

SINGLE "C" HOOK

Heppenstall

. . . tongs for every lifting problem

Seeks Regulation for Union Funds

State or federal control of organized labor's welfare funds is goal of Rep. McConnell . . . Cites cases of mishandling . . . Government to unload real estate—By G. H. Baker.

Labor union welfare funds, now subject only to the control of union officials, appear to be headed for regulation by federal or state boards. Whether or not such control can be legislated into effect this year remains an open question, but Chairman McConnell of the House Labor Committee is determined to impose some kind of governmental supervision of welfare funds as a safeguard against mis-spending or misappropriation of the union member and company contributions.

House Labor Committee has received a number of complaints concerning the way some union welfare funds are being handled. Some of the complaints cited by Rep. McConnell concern the levying of excessive welfare dues on employers and employees.

Unload Real Estate . . . The Federal Government's extensive holdings of industrial real estate (both leased and owned properties) are due to be whittled down extensively in the months ahead. General Services Administration —the government housekeeping agency—has ordered all other departments and agencies to report by Feb. 1 all properties that can be regarded as surplus.

Unloading of a hefty part of the government's swollen inventory of real property will cut maintenance costs, return revenue to the Treasury, and will produce tax revenue for the states and municipalities by ending the tax-exempt status of the properties.

Washington has never had an accurate inventory of all federal real property. Data produced in the current survey of what's needed and what is not in real property holdings are to be fitted into another GSA project now in the works—actual inventorying of all federal real property.

Seaway Out for '54 . . . The Administration's efforts to hold the new budget to the minimum just about rule out the possibility that the U. S. will join Canada this year in development of the St. Lawrence Seaway.

Despite the Canadian government's announced intention of building the seaway with or without U. S. assistance, there is a widespread belief within the Administration that the Canadians will delay their construction plans for a time in order to give the Congress every opportunity to pass seaway legislation.

President Eisenhower frankly doesn't believe that 1954 provides the "last chance" the U. S. will have to join in a cooperative building program with Canada. While he believes in the need for the seaway, and has gone on record as favoring its construction, he is not prepared this year to fight an all-out battle with Congress for its endorsement. White House view is that 1954 is by no means the "year of decision."

"Perkins, I've been thinking of giving you a raise."

Shipyard Stepchild . . . Due to the fact that U. S. merchant marine has become "a stepchild of government planning," it is dangerously possible that as much as 80 pct of all shipping in the maritime service will be obsolete within the next 10 years.

U. S. shipbuilding policy has been to pour millions of dollars into ship construction in time of war or emergency and then to forget the shipbuilding industry in time of peace. Under this policy, the U. S. spent around $3 billion for ships in World War I and $19 billion in World War II.

This costly approach produced ships never designed for service beyond the emergency in which they were built. World War II Liberty's, for example, were obsolete before the war ended.

Congress is not unsympathetic to the industry's plight, but this year's forthcoming effort to delete all but absolute "must" items from the federal budget probably spells another year of postponement to a long-range shipping program.

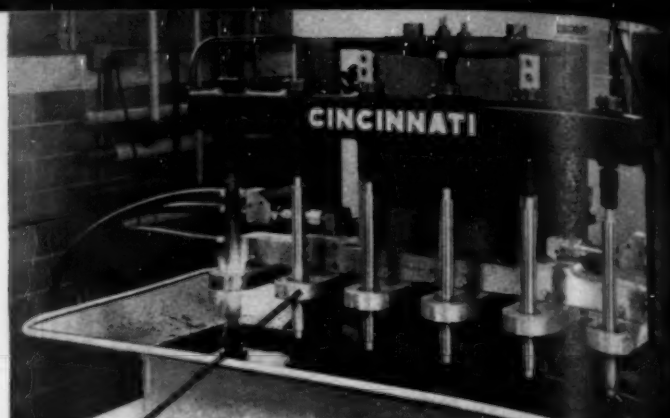
Set Up New Aid . . . Small Business Administration hopes it will be able to aid firms too small to maintain packaging and shipping experts by furnishing free pointers.

Complete sets of 324 government packaging and packing specifications most commonly used by small business firms have been placed on file, available for reference, at all field offices.

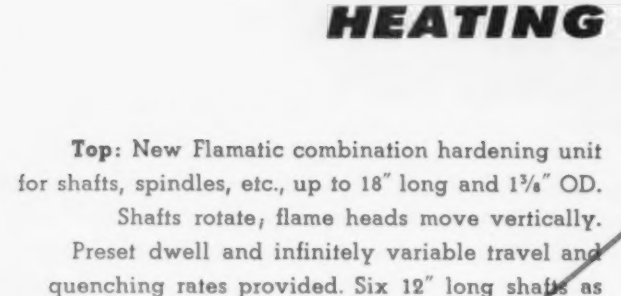
In addition, business men may also pick up at these same SBA field offices free copies of a leaflet entitled "Packaging Pointers for Government Contractors."

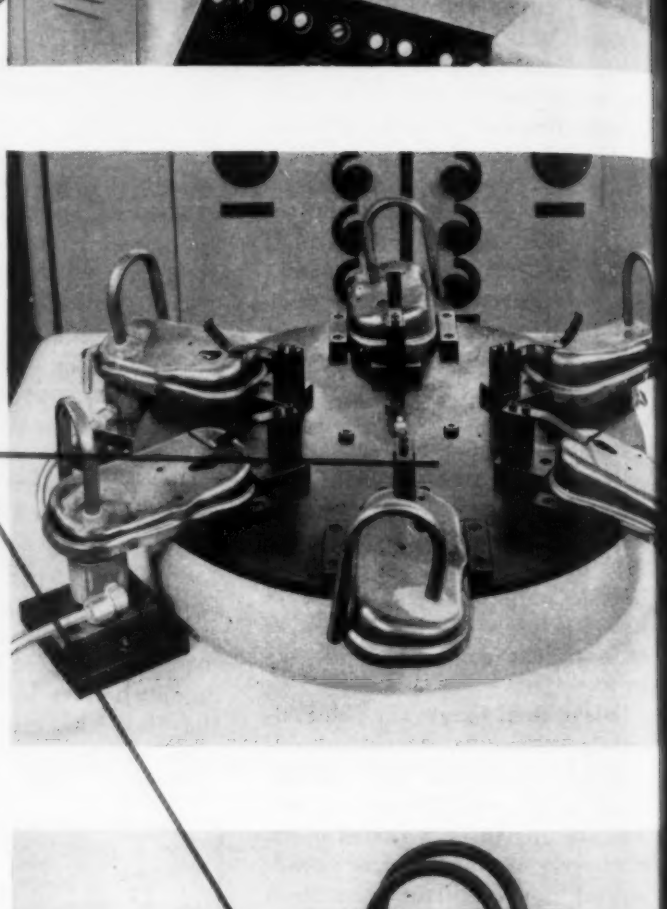
what's new

IN FLAMATIC SELECTIVE HEATING



Top: New Flamatic combination hardening unit for shafts, spindles, etc., up to 18" long and 1⅜" OD. Shafts rotate, flame heads move vertically. Preset dwell and infinitely variable travel and quenching rates provided. Six 12" long shafts as illustrated are hardened in 120 seconds, floor to floor.



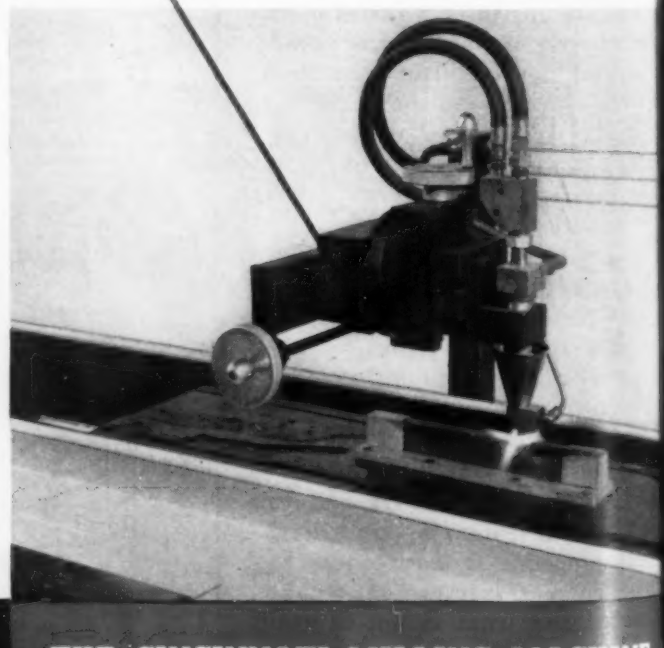


Center: New Flamatic brazing unit has turntable which operates automatically, indexing is continuous. Wide range of parts accommodated. Heating time can be preset up to 60 seconds.

Bottom: New Flamatic progressive hardening unit for racks, wear strips, etc. Flame head is stationary. Work table handles parts up to 3" wide, 36" long. Table travel infinitely variable from 4" to 110" per minute.

New Flamatic Power Control Unit, latest addition to Flamatic line, comes in three sizes with heat output capacities up to 4,500,000 Btu/hour (equivalent to 1320 kw/hour). Connects readily with variety of Flamatic auxiliary selective heating units for hardening or brazing. Controls flow of oxygen and fuel gas for flame heads, and water for quenching, regulates air pressure for cooling welds and for work movement devices, and controls the electric power for automatic cycling. Operates efficiently with almost any fuel gas over entire range of heat output . . .

Write for Catalog M-1824
or send parts for analysis and recommendation.



flamatic

THE CINCINNATI MILLING MACHINE

Cincinnati 9, Ohio, U.S.A. •

East-West Trade:

Tighter watch on strategic goods, ease up on others.

New U. S. policy regarding trade with the Soviet bloc: More strict controls on traffic in strategic goods, relaxation of controls on non-strategic goods.

That's the way Foreign Operations Director Harold Stassen describes the official approach to problems related to East-West commercial channels. He says standing policy was given a new direction after the National Security Council completed a study of trade with Communist countries.

Control Shipments

In keeping with the current plan, State Dept. retains jurisdiction over licensing for export of arms, ammunition, and implements of war but relinquishes to Commerce Dept. authority to license electrical apparatus, scientific and professional equipment, unarmored amphibious vehicles, and photographic and projection supplies.

These items, no longer classed as war weapons, are still considered strategically valuable, and their shipment abroad will be controlled.

No Major T-H Changes

The White House has cast its lot with the Taft-Hartley Law, believing a majority of labor's rank and file will stand by the Administration—providing some rough spots are smoothed out.

This was made clear last Monday in a special message to Congress which held that major changes are not now "desirable or required."

Some 14 specific changes or revisions are recommended including government supervision of secret strike votes, clarification of secondary boycott provisions, and provision that a striking union must be regarded as representative of plant employees for a period of 4 months.

Provision in present laws that workers striking for wage increases cannot vote for selection of union representation has been held by labor to be of union busting nature. Recommendation for elimination of this provision keeps a pre-election promise.

It is also recommended that a clear definition of secondary boycott be written into the law.

This, declared President Eisenhower, should be a discretionary matter. It is suggested that it should be made clear that strikes against farmed-out work by a struck contractor or construction work on the site of a struck plant are not secondary boycotts but part of the basic "concerted action."

Other changes suggested include: Setting up of a special board to work with disputants when an injunction is obtained; that because of unusual conditions in construction, amusement and maritime industries, the union shop conditions be reduced to 7 days. It is urged that the communist disclaimer conditions also be made applicable to employers; that jurisdiction between state and federal governments be clarified; and that federal standards be set up for welfare funds with legislation for their protection.

Corporate Worth Continues Climb

Operating position of U. S. corporations continued to improve during the third quarter 1953, according to the Security & Exchange Commission.

During the third quarter working capital of corporations increased $600 million which leaves the net working capital at $88.5 billion after taxes, debts and other liabilities.

"Boy, those were the days! Here's another convertible coupe with white walls, $895 F.O.B. Detroit."

Manpower:

Unemployment rise increases controversy on policy

Census Bureau last week reported a rise of 400,000 in unemployment figures, thereby adding fuel to flames of growing controversy over Administration manpower policies.

Linked with reports of industrial lay-offs here and there, debate has been touched off which stands a good chance of ending up in a legislative attempt to establish national manpower policy by statute.

This the Administration doesn't want. In effect, it would tie the hands of the White House and the Office of Defense Mobilization as far as taking fast emergency action is concerned.

Charge It's "Preferential"

Root of the matter is the present manpower policy, revised last November by ODM in accordance with a promise to Congress and approved by the White House last week.

Current policy offers incentive for construction of new industrial enterprises in labor distress areas and provide for setaside of defense orders for firms already in those areas.

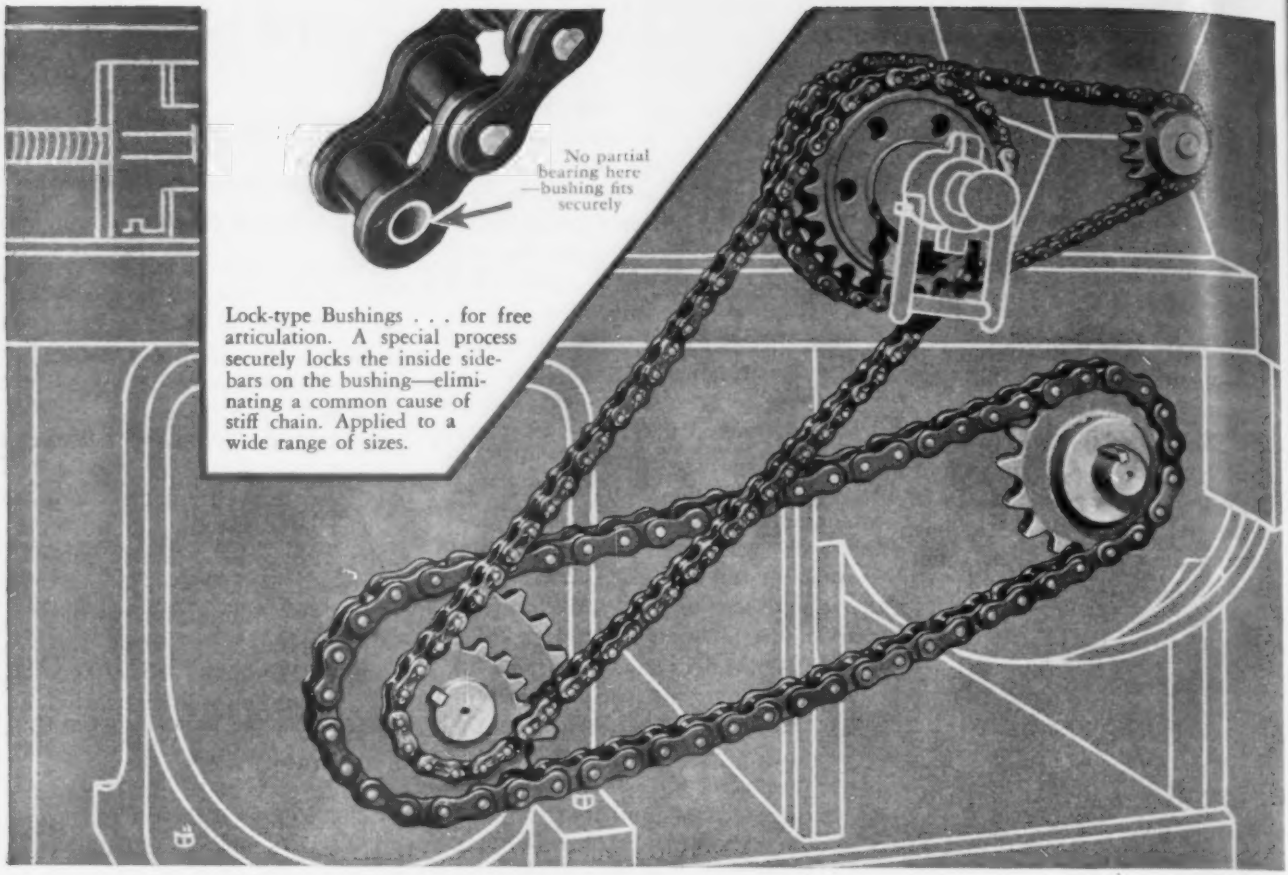
But numerous unhappy congressmen charge that the revised policy still bucks the will of Congress, that it still permits flagrant "preferential" practices.

Predicts Action

What will happen when the matter comes to a head is problematical. Majority Leader Knowland of California predicts definite legislative action for "further clarification, further restriction."

In this, the Republican leader has the support of influential Democrats such as Senators Burnet R. Maybank of South Carolina and John J. Sparkman of Alabama.

Labor has generally maintained a hands-off attitude except to "welcome any move" to help labor. It has said, however, that the present manpower policy does "little more than scrape the surface" of labor surplus problems.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Lock-type Bushings . . . for free articulation. A special process securely locks the inside sidebars on the bushing—eliminating a common cause of stiff chain. Applied to a wide range of sizes.

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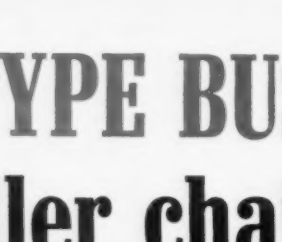
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CLEARANCE ON INNER SURFACE FOR EASY ASSEMBLY
PRESS FIT
PIN CONTACTS OUTER SURFACE FOR LOAD DISTRIBUTION

Couple and uncouple multiple-width chains more easily.

Closer heat treat control helps attain greater uniformity.

New Bookings Perk Up Steel Market

Recent downward trend in Coast steel sales braked by early January orders . . . Rebuild inventories for spring building, farming . . . Most mill items plentiful—By *T. M. Rohan.*

The tide was beginning to turn for the western steel industry last week.

Definite predictions are still premature, but the downward market trend has started to reverse itself with early January mill bookings.

One leading producer reported first quarter books shaping up better than expected, due probably to build-up of inventory after letting it run down for tax and accounting purposes. Another producer reported "a marked increase in sales the last 10 days" and a third said "things are picking up slowly but surely." Even on wire products and reinforcing bars, which have been very slow, orders are increasing in anticipation of the spring season in agriculture and construction.

Plates Loosen . . . For the first time in years plates are loosening. Western plate consumers, who have accepted allocations as just another of life's tribulations, were finding last week they could get February delivery without trouble. One producer is accepting second quarter plate orders without restrictions for the first time in years although schedules are tight through the first quarter.

The other western producer reported delivery on plates has been considerably shortened. Overall selling has also picked up in most categories in the last 10 days.

Only in wide flange beams is the end of a seller's market still out of sight. Widely used in construction and only made in relatively small quantities in the West, this item has been short for years, will probably be the last to ease. Some shortness of supply has also crept in on galvanized sheets which traditionally run hot and cold. End of mill difficulties by one producer are expected to alleviate this within weeks.

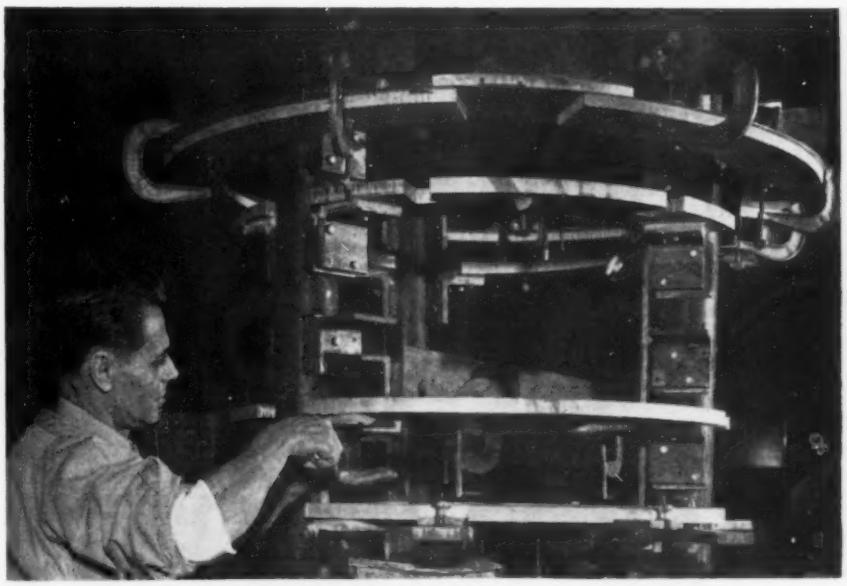
Pig Is Headache . . . Marketing of pig iron by U. S. Steel and Kaiser continues to be a headache. Columbia-Geneva's Ironton plant in Utah, which has been down to one of its two furnaces since mid-year, closed down the second last week for lack of merchant iron sales. About 126 of the staff of 326 will be retained for maintenance and the other 200 will probably be absorbed elsewhere at the Geneva Works.

At Fontana, Kaiser started relining its original No. 1 blast furnace which had a near-breakout in December. The furnace turned out over 2 million tons since start-up with one relining. It will be out of operation until about mid-February, but steel production will be uninterrupted due to accumulated inventory of pig and step-up in production on remaining two furnaces which have been at under-capacity output due to slow pig iron market.

Imports continue a minor irritation with 4000 tons of Australian pig being offered by a leading Oakland importer at $51.20 f.o.b. dock at Oakland, about $14 under delivered price from Salt Lake City.

Aluminum Makers Reach . . . Like the steel industry last year, aluminum producers are reaching into lower tonnage, lower profit products for new business. Orders for items like extra wide sheets which mills had been hesitant to accept even with extras are now being classed as standard with fast deliveries.

Kaiser last week announced several major standardizations in the drive for increased sales, in competition with Alcoa and Reynolds. Most were in sheet and plate products on which the firm has major capacity at the Trentwood, Wash., mill. Extrusions, rods, bar, wire, billets and the new welded tubing were also included.



DENTAL PLASTIC is used to fill cavities by Convair toolmakers, saving the firm's San Diego Div. approximately $43,000 annually. Molten metal was formerly poured around assembly-fixture locator pads, used to maintain pre-set dimensions. Tests showed that dental plastic takes loads up to 11,500 lb without cracking.

"MARVEL" HAS always had the edge

MARVEL High-Speed-Edge Blades assure Faster, more Accurate cutting with proven Economy and complete Safety. Only the MARVEL is a composite blade with a high speed steel cutting edge electrically welded to an exceptionally tough, strong alloy steel body.

The High-Speed-Edge does the cutting while the alloy back, with hardened eyes, carries the load. Blade tensions up to 300% higher than those possible with ordinary blades are recommended. This greater tension is confined to the cutting or leading edge by the location of pin holes (exclusive MARVEL design feature) and cannot be overcome by work resistance. Heavier feeds and greater speeds are practical without "run out."

With greater accuracy, higher production and lower cost per cut, comes the extra dividend of Safety, for MARVEL High-Speed-Edge Hack Saw Blades are Positively Unbreakable—*they will not shatter.*

Ask your local MARVEL distributor (see classified phone book) to help you modernize your metal sawing with Marvel High-Speed-Edge Blades. They cost no more than ordinary blades.

1. High-Speed-Steel cutting edge.

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Next War—A Tool Shortage?

Navy captain asks for long range armament budgeting . . . Fears current 12-month budget limits weapon planning . . . Last war's tools not enough—By *E. J. Egan, Jr.*

Will there be enough of the right kind of machine tools ready for war production when and if another war comes? Will the customary 12-month system of federal budgeting be good enough to prevent a shortage of production tools?

Capt. R. E. W. Harrison, USNR, warns of danger. Writing in the *Journal of the American Society of Naval Engineers*, he asks that armament budgets be extended and coupled with long range planning for the design and development of new weapons.

Changes in arms design often require changes in the machine tools needed to mass produce them. Stockpiles of standard, or "last war's" machine tools may not be enough of a safeguard to prevent disaster. The Korean emergency showed that armament changes over a few short years made much of the World War II metalworking equipment obsolete.

Force Limited Planning . . . Government budgeting and planning policies are not geared to give the machine tool industry the necessary degree of preparedness, Capt. Harrison believes. Twelve-month budgets force ordnance designers to limit their planning to short cycles. But technological and arms progress occur in eras, not 12-month periods. Armament programs should be planned and budgeted to span these eras.

New weapons, intended for combat use should be carried through at least to pilot line production. Issuance of limited machine tool contracts would at least insure design of the most efficient production equipment. A portion of long range arms funds could be conservatively and continuously invested in these new types of tools, and the industry would be fully prepared to build them in quantity if the need arose.

Study Machinability . . . Are machinability problems likely to plague ordnance manufacturers if a new war creates a shortage of steel alloying elements? Army Ordnance Dept. was concerned about this possibility, asked the Minerals and Metals Advisory Board to check. The Iron & Steel Technical Committee of the SAE volunteered to take on the project. A special group known as Division XI was set up to do the legwork among ordnance makers and report its findings.

The Division XI report should be comforting to the Ordnance Dept., and educational to anyone interested in steel analysis, heat treating procedure and fabricating practices conducive to the best machinability of ordnance materials.

Referring to World War II production experience with triple alloy steels (86XX), the report concludes the machinability of military components was not significantly affected by the substitution of these low alloy steels for unavailable higher grades.

"I'm bored."

Korean Substitutes . . . During the Korean emergency further efforts were made to reduce the nickel and molybdenum content of the emergency World War II alloys. These efforts were accompanied by moderate increases in manganese and chromium specifications (for example the tentative standard AISI and SAE steels), and by the use of boron.

The Division XI group studied the use of these alloys in intermediate and high carbon grades. Applications involved the manufacture of parts subjected to all types of machining operations. The verdict: ". . . that the use of boron and tentative standard AISI and SAE steels in ordnance will not necessarily introduce any difficulties with respect to machinability."

Findings Confirmed . . . An appendix to the report states that the new steels, especially those with boron additions, should improve machinability. This opinion confirms findings recently published in an IRON AGE technical article, *How Do Boron Steels Compare in Machinability?* (THE IRON AGE, Oct. 29, 1953, p. 94).

Best news is that these favorable opinions apply to the big ordnance items—guns, armor and projectiles—that use heavy tonnages of steel. Some fabricators of case carburized gears and bearing races did report reductions in machinability when using the tentative standard and boron steels. But from a tonnage angle, these and similar carburizing applications would be a minor item of the total.

In machining alloy steels, the structure (lamellar, spherodite or acicular) is more important than chemical composition. Division XI study shows nothing in substitute steels to prevent ordnance manufacturers from obtaining the most desirable grain structures for particular machining operations.

For six years the engineers of this large butadiene plant kept cutting samples out of their INSUL-MASTIC coatings. They wanted to determine the condition of the metal or insulation underneath. What they found was so satisfactory that INSUL-MASTIC was specified when the three new towers above were built. It takes excellent results to command a repeat performance from such critics.

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REPORT TO MANAGEMENT . .

Are you sure of prosperity?

From the glut of optimistic business predictions, do you feel reasonably sure that 1954 will be a year of continued high prosperity with only a slight easing? This page forecast a prosperous '54 as far back as last August and still sees the economic cards stacked in our favor.

How complacency can hurt

But if you believe prosperity is inevitable, you may be prone to complacency. This may muddle your perspective in evaluating your individual business prospects and perhaps impair your plans for meeting what will be a "hard sell" year. Some firms must sell harder than others for never does everyone share equally in good times. If in the boom you have taken more than your accustomed share of the market, you must struggle doubly hard to hold it. If you have launched a new product it will be tested this year. And dissimilar products will also press harder for the consumer's dollar.

Is forecast useful?

There is a saying that "economists are more often wrong than right." Knowing their record, you can skeptically say that ever since World War II they have been preaching recession--and this time it's prosperity. Do failures in the past invalidate the economic prediction? Not at all--if you accept it as only an estimate of future economic conditions based on economic facts of today. Remember that any number of economic and psychological unpredictables invariably alter economic forecasts either way.

Establishes general climate

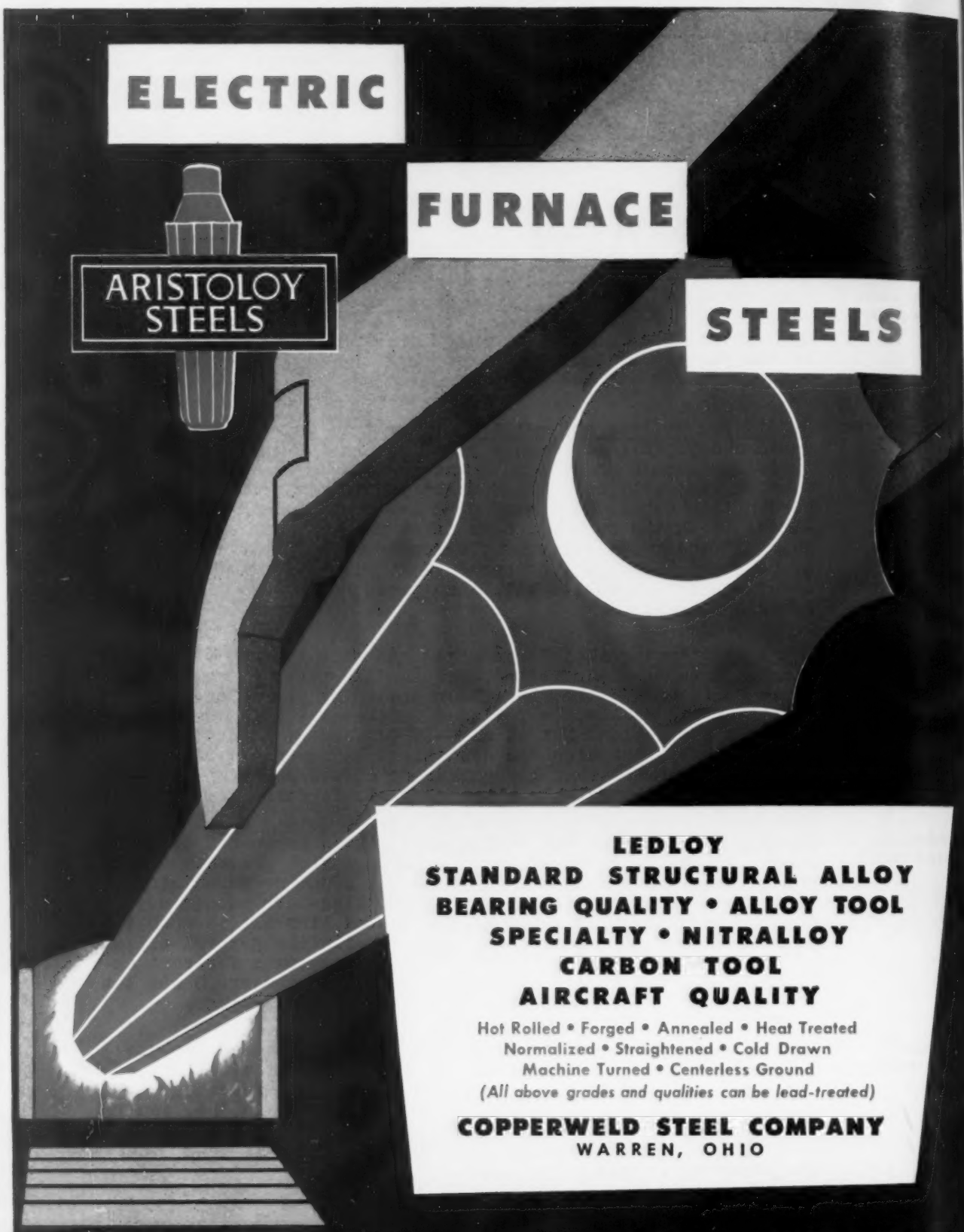
Nowadays you need a gage of future business prospects to plan ahead. The market analysis and forecast, which projects demand for an individual product, has become a sound merchandising tool. When supplementing this with the long-term economic prediction consider that value of the second lies not so much in estimating specific conditions as in predicting general climate of future business. The farther ahead an economic forecast extends itself the closer it verges on pure hunchwork. Don't let the long-term forecast lessen your alertness to change.

Why the wrong guesses?

Why is economic forecasting such an inexact science? Because economists place varying values on business indicators and interpret them differently. You can best serve your company by remembering that if you want to stay prosperous in '54, you'll have to work hard at it. Don't feel so secure that you dull your ability to adapt to a change--or if predictions go sour stampede the other way.

Sensitive economic areas

If you've become more interested in the near-term outlook, a few areas to watch in future weeks are sales, inventories, production, backlogs and employment. In November, all edged down. If industry can soon lower its inventory levels to balance with prospective demand, the sales decline may cease and production register an increase. Unemployment, though still low, is on the rise. And the question is whether production, sales, inventories can stabilize soon enough to put the economy at a firm, high level so that employment downtrends do not seriously harm purchasing power. There is room for optimism on all these economic problems which now constitute the most important phase of industry's adjustment.



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The illustrations and accompanying descriptions of these parts indicate the *versatility* of the Hydroforming process . . . and this bona-fide example of comparative time and tool cost savings indicates its *economy!*

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c 21½" ID, 4¾" deep with a reverse draw 4⅛" deep. Drawn from a 32" blank of 1/16" stainless in three operations.

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For free copy circle No. 13 on postcard, p. 81.

Feed pumps

New bulletin dealing with the design and operation of Controlled Volume Chemical Feed Pumps from basic units to specialized models has been released by Milton Roy Co. Complete systems are illustrated to show the application of these pumps in pH control, automatic titration and proportional feeding. Some new designs, including the Constametric, are discussed in bulletin. This model is a reciprocating plunger, positive displacement type pump which produces a straight line, pulsation-free flow. *Milton Roy Co.*

For free copy circle No. 14 on postcard, p. 81.

Core dryer

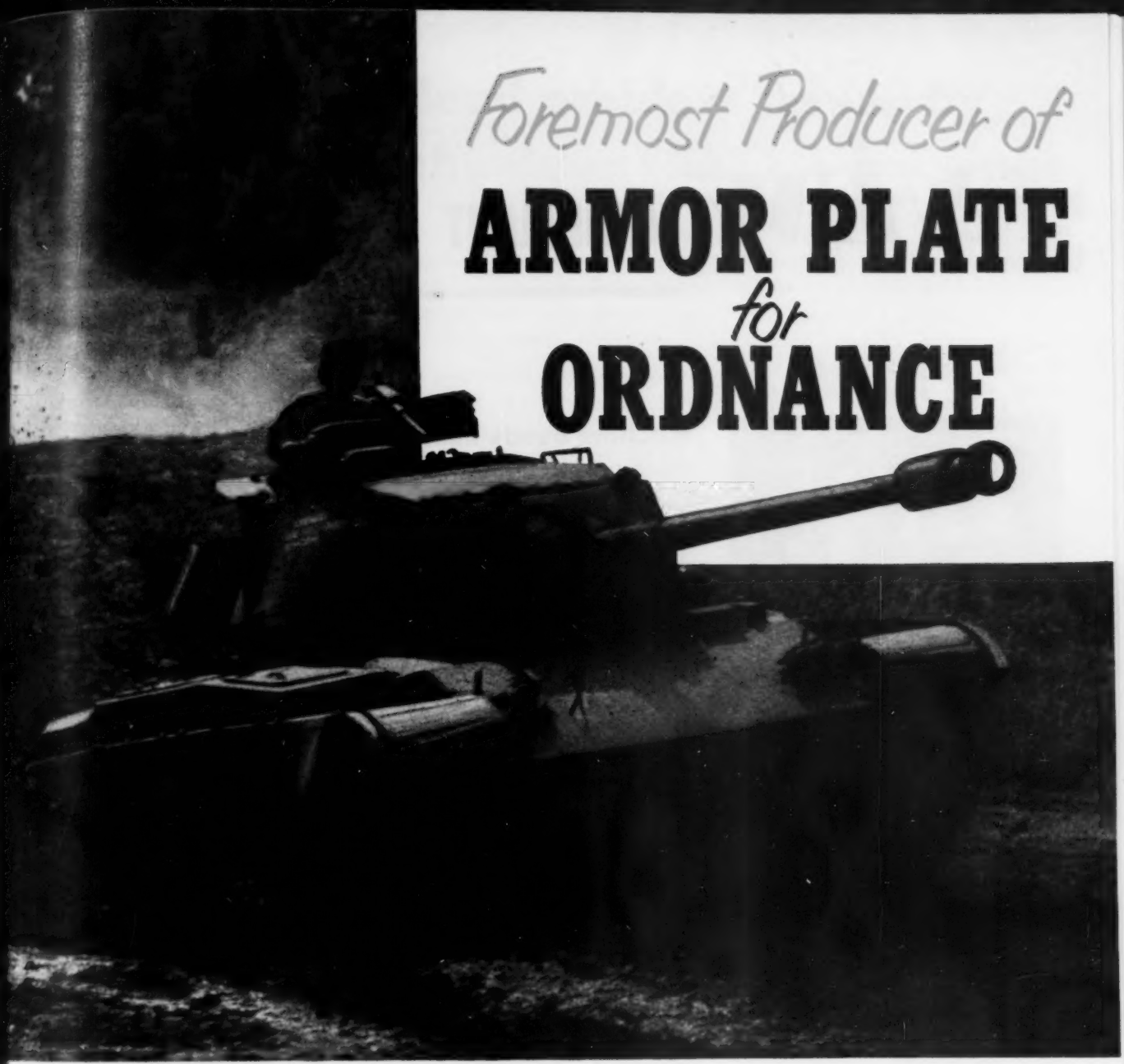
How dielectric heat is able to overcome many disadvantages of conventional core baking methods in foundries is described in article, *Curing Intricate Cores With Dielectric Heat* now available as a reprint from Allis-Chalmers Mfg. Co. Article tells of the development of dual heat core dryer and discusses preparation and curing of cores and core assembly and casting. *Allis-Chalmers Mfg. Co.*

For free copy circle No. 15 on postcard, p. 81.

Gear hoist

New 4-p bulletin describing Coffing Challenger is now available from Coffing Hoist Co. The Challenger is a light-weight spur gear hoist of formed steel construction that features easy portability and resistance to shock load breakage. *Coffing Hoist Co.*

For free copy circle No. 16 on postcard, p. 81.



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New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 81 or 82.

Machine bends finned or plain metal tubing

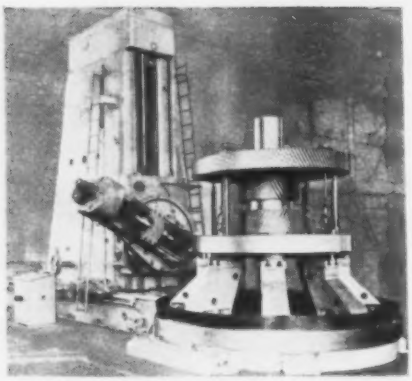
Semi-automatic hydraulic powered machine makes bends varying from ¾ in. to 2 ft radius in finned or plain ferrous and nonferrous metal tubing up to 40 ft long. The machine bends tubing up to 1½ in. diam around a cone-shaped steel die that is adjustable both vertically and horizontally to provide bending radii in infinitely variable increments within the large and small diameters of the cone. Larger bend radii up to 2 ft are attained by nesting hardwood cones of larger sizes over the conical steel die. Bending table is powered by a high torque, positive displacement, single vane, one revolution hydraulic motor. *Walter P. Hill, Inc.*

For more data circle No. 17 on postcard, p. 81.

Enameled steel roofing for building construction

Improved enameled steel roofing and siding materials called V-Corr is specially suited for industrial building construction and repair. V-Corr is made from a corrugated steel base to which porcelain enamel has been fused at 1550°F. The enamel coating on the corrugated steel offers complete protection against fire, corrosive gases, moisture, steam, smoke and salt air. Sheet squares of 100 sq ft are available in a range of different gage steels from 18 to 24 gage. *Toledo Porcelain Enamel Products Co.*

For more data circle No. 18 on postcard, p. 81.



Mammoth gears can be cut on new gear hobbers

Gears up to 23 ft diam can be cut on the largest of four new standard model Schiess RF precision gear hobbers. Adaptable to the cutting of spur, helical and herringbone gears and worm wheels of either low or high lead angle, the Model RF design includes a fixed table accurately centered on its vertical axis and capable of supporting gear blanks ranging from 20 to 80 tons. A moving column is adjustable both for the diameter of the gear and the depth of the tooth. Hob saddle carrying the swivel head travels on the vertical ways of the column and is balanced to permit cutting in upward or downward direction. Very large master worm wheels are used to assure accuracy of indexing. *Kurt Orban Co., Inc.*

For more data circle No. 19 on postcard, p. 81.

Drawer-type oven preheats laminated phenolics

For pre-heating laminated phenolics prior to forming, this new forced convection oven is so constructed to completely surround the phenolics with uniform high temperature air. It is equipped with pushbutton controls to close the drawer and reset the timer, to repeat the operating cycle. Maximum temperature is 600°F and timer is set to limit the soak period and automatically open the drawer when the soak period is finished. The drawer is powered by an air cylinder with solenoid valves. Plus or minus 5°F temperature control is said to be possible with proper instrumentation. *Coates Electric Mfg. Co.*

For more data circle No. 20 on postcard, p. 81.

Turn Page

Tough double load problem solved by mounting crane wheels on TIMKEN® bearings

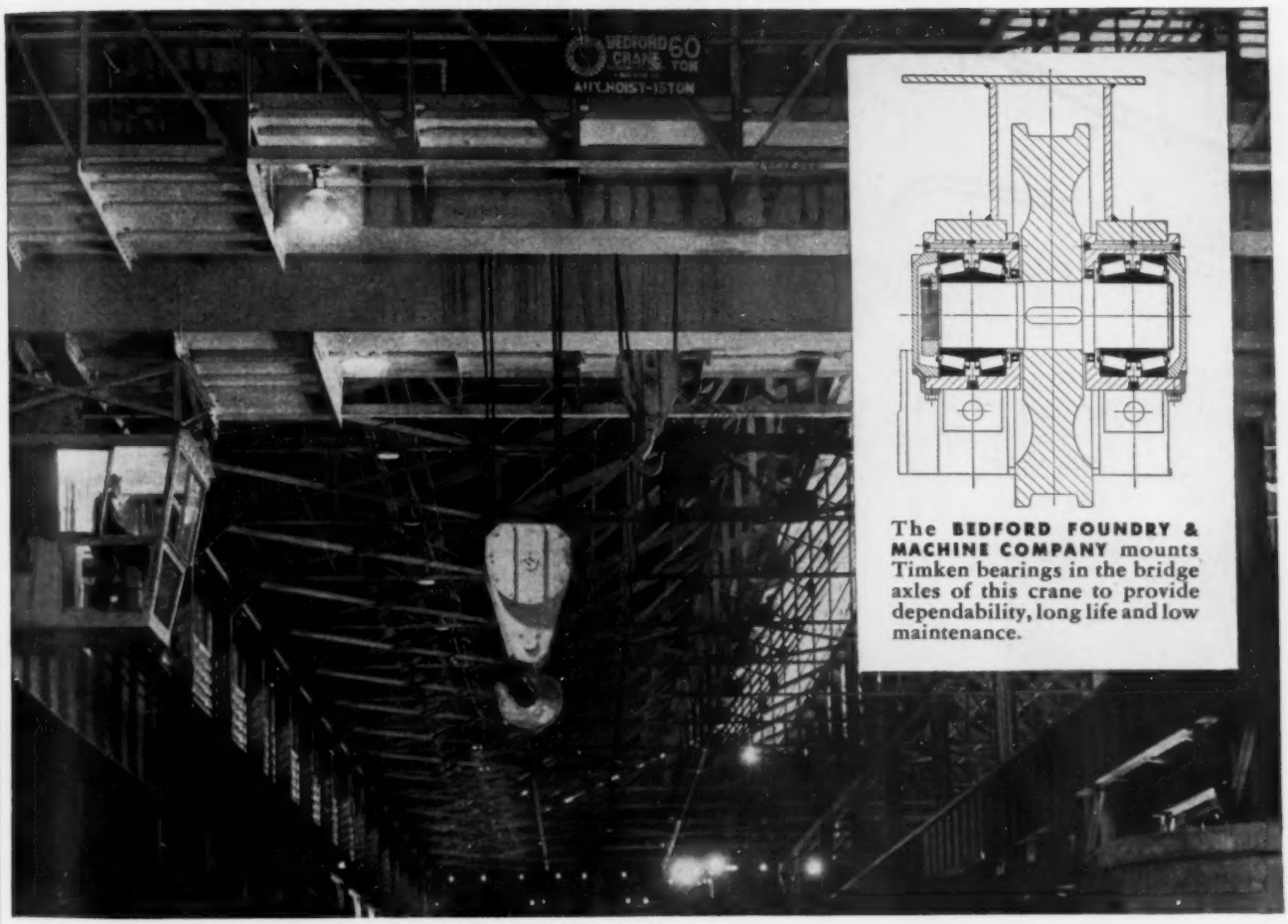
DOUBLE duty! That's the performance that Timken® tapered roller bearings deliver in this 60-ton crane, built by Bedford Foundry & Machine Company.

Mounted on the bridge axles, Timken bearings do the job of both radial and thrust bearings. They handle the continuous, heavy radial load of the loaded hook *plus* the rugged thrust load imposed by the hook's pendulum swing. The reason is simple. Tapered construction of Timken bearings enables them to take tough radial and thrust loads in any combination.

Also important, Timken bearings help lower power bills. The true rolling motion and incredibly smooth surface finish of Timken bearings practically eliminate friction. As a result, the wheels start quickly and turn smoothly. Less starting current is required. Electric bills are reduced.

To solve dual or multiple load problems in the equipment you build or buy, always specify Timken bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



The **BEDFORD FOUNDRY & MACHINE COMPANY** mounts Timken bearings in the bridge axles of this crane to provide dependability, long life and low maintenance.

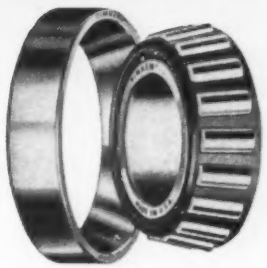
IT'S TIMKEN BEARINGS FOR VALUE!

To get the best value in bearings you may find this simple formula helpful:

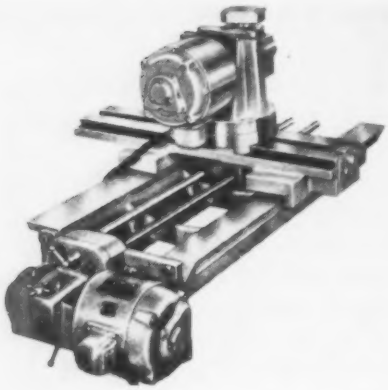
$$Value = \frac{quality + service + public\ acceptance}{price}$$

Obviously a big advantage *above* the line gives you more value than a small one *below*. No other bearing can match the uniform high quality, engineering and field service and overwhelming public acceptance you get with Timken bearings.

TIMKEN
TRADE-MARK REG. U.S. PAT. OFF.
TAPERED ROLLER BEARINGS



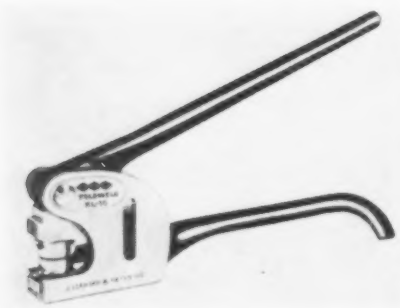
NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST ⊣◫⊢ LOADS OR ANY COMBINATION



Portable mill refinishes all wearing surfaces

This improved portable milling machine is equipped with electric drive instead of air. It consists of a bed with fitted ways and feed gear box electrically driven with three speeds and rapid traverse return; a feed-across slide with dovetailed ways and a feed change gear housing, making possible a horizontal and vertical feed. The working head bracket, mounted on the circular slide, can be rotated 360° and the working head can be rotated 200°. The spindle, driven by an electric motor through bevel gears, is mounted on Timken roller bearings. Nose of the machine has an 8 pitch 1½ in. diam standard thread and a No. 7 B&S taper. Refinishing surfaces at 90° angles from each other with one setting of the machine is possible. *Atlas Portable Machine Sales Corp.*

For more data circle No. 21 on postcard, p. 81.



Tool lap welds aluminum sheet or foil

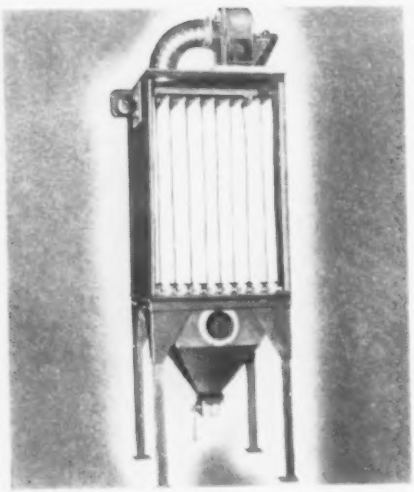
Lap welding of aluminum sheet or foil without heat or electricity and without flux or chemical is possible with the new Koldwelding tool. It is hand-operated and accomplishes the welding of aluminum foil, sheet, shaped extrusions or strip by pressing the surfaces of the parts together between specially designed dies. To prepare the metal surfaces it is necessary to clean them with a steel wire scratch brush or similar mechanical action to remove surface oxidation, dirt and grease. Thicknesses handled are 0.001-0.040, or an overall maximum thickness of 0.080. *Utica Drop Forge & Tool Corp.*

For more data circle No. 22 on postcard, p. 81.

Coolant cooler permits more accurate machining

New coolant cooler for high production machining operations on hones, lappers, surface grinders, thread grinders and other applications requiring greater control over coolant temperature is designed for normal installation in the coolant line between the pump and the nozzles. The coolers permit more accurate machining, closer working tolerances, improved surface finishes and longer tool life. It is stated the rejection rate is reduced materially due to lower coolant temperature control. Less change in size of metal being worked eliminates out-of-round, out-of-size and distorted or poor finishes. Tool life is increased through greater control of the viscosity of the coolant. The units are available in a variety of capacities and sizes. *Webber Mfg. Co., Inc.*

For more data circle No. 23 on postcard, p. 81.



Dust collection for smaller volume applications

Unit-type CN cloth bag collector is designed for indoor dust collection and cleaned air can frequently be discharged inside the plant—a saving where air is heated or cooled. Finely divided dusts such as carbon black, graphite, pigments and metal oxides are collected through cloth filter bags. Dust laden air enters the collector where it is expanded in a settling chamber. The reduction in velocity drops coarser dust particles directly into the hopper. A baffle plate prevents the air from rising immediately to the cloth bags; finally escapes through the open bottom of the bags. This air then flows into the bags where the fine dust particles are filtered on the bags' inner surfaces. Cleaned air passes through the bags and is discharged from the collector. The bags are shaken mechanically to remove dust from their inner surfaces. This dust falls directly into the hopper. *Pangborn Corp.*

For more data circle No. 24 on postcard, p. 81.

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The Iron Age
FOUNDED 1855
Technical Articles

SMOKE, DUST, FUMES
Closely Controlled In Electric Furnaces

By R. S. Coulter
Assistant to Vice President
Bethlehem Pacific Coast Steel Corp.
Los Angeles

◆ Better working conditions, improved community relations, lower maintenance costs have resulted from use of improved smoke control equipment on electric furnaces operated by Bethlehem Pacific Coast Steel Corp. at Los Angeles . . . From 12,000 to 20,000 lb of dust are collected daily.

◆ About 75 pct of all dust by weight is generated in the first half of heat time . . . This high load, plus temperatures and physical characteristics experienced, led to selection of electrostatic precipitation equipment.

◆ Local regulations require high operating efficiencies . . . Amount of dust emitted varies with cleanliness of the scrap charge . . . Negative pressures at the furnaces help keep plant clean.

◆ A BETTER PLACE TO WORK and a cleaner community to live in have resulted from successful control of smoke and fume from three electric steelmaking furnaces operated at the Los Angeles plant of Bethlehem Pacific Coast Steel Corp. From 12,000 to 20,000 lb of dust are collected daily. The equipment, designed to operate within stringent local regulations, required 4 years to develop.

Dust generation may run as high as 1125 lb per hour and 30 lb per ton of process weight in large electric furnaces. Temperatures and other characteristics of dust and fume led to selection of the electrostatic precipitation method of collection. A controlled negative furnace pressure, maintained by means of exhaust fan, vents and dampers, has eliminated all dust and fume emissions from electrode openings, paving the way for fewer maintenance delays and other benefits.

Three top-charged arc electric basic furnaces are used to make plain carbon and low alloy steels in a single-slag process. Two are rated at 75 tons capacity and one at 50 tons. The plant, in Los Angeles County, is subject to regulations of the County Air Pollution Control District. In limiting dust and fume emissions local law requires qualitative as well as quantitative results.

The amount and physical character of charged materials as well as the speed of melt-down influence the rate of generation and character of the dust and fumes. Provision must be made to capture particulate emissions

corresponding to the worst or dirtiest condition of scrap charge melted and shaped. Approximately 75 pct of total dust, by weight, is generated in the first half of heat time.

Dust emissions averaging as high as 30 lb per ton of total charge weight have been recorded. This, however, is for heats in which charges were particularly dirty and the quality of scrap less than good. A typical furnace charge, and composition of the dust emitted, are shown in the table. Particle size varies with chemical analysis. With cleaner charges of selected scrap, dust generation will be under 30 lb per ton of charge.

To collect the composite material in these amounts and in compliance with local air pollution laws, posed a problem. With operations of this magnitude the law limits the maximum weight of particulate matter from any one source in any hour in accordance with the equation.

$W = KP + 4.$

Where: W = allowable weight of particulate matter discharged to atmosphere per hour in pounds.

K = constant having a numerical value of 0.0006 for average hourly process weights between 4500 and 60,000 lb per hour.

P = Average hourly process weight in pounds.

High collection efficiencies are needed to comply with the air pollution laws. Assuming a furnace charge weight of 100 tons of metallics, fluxes and additions making a heat in 4 hours, maximum allowable discharge of dust and fume in any one hour would be:

$$\frac{0.0006 \times 100 \times 2000 + 4}{4} = 34 \text{ lb}$$

Total generation of dust and fume from a dirty charge, as given above, has averaged as high as 30 lb per ton of process charge weight, or for this example 3000 lb total. If 75 pct of this is generated in one-half the heat time, we would have a maximum hourly generation of 1125 lb with an allowable discharge of only 34 lb. To comply with the law, collection efficiency would have to be close to 97 pct.

Equipment choice was narrowed to two types: electrostatic precipitators and bag houses. The latter type was eliminated due to the temperatures involved. A 24-hour chart shows typical temperatures of gases and particulate matter issuing from annular openings around the furnace electrodes. These temperatures have been modified somewhat by dilution with considerable quantities of infiltration air at atmospheric temperature. Initial volumes were too large to consider further air dilution to effect a temperature low enough for bag house operation.

Cottrell type electrical precipitation equipment was selected after pilot plant tests on this and other types of collectors, including washers and scrubbers. Dry type electrical precipitation was originally installed principally because of the shortage and expense of water and lack of space for installation of sludge thickeners and filters.

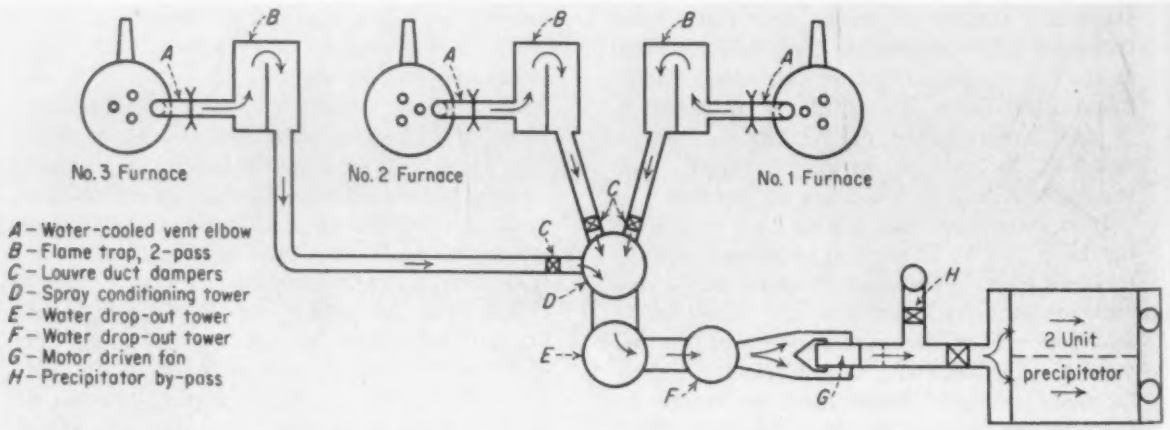
Gases and dusts originating in the furnaces are drawn off through a water-cooled vent elbow, one end of which coincides with an opening in the furnace roof. Gases are then drawn through a two-pass flame trap, individual duct and louvre damper, a series of towers, and a motor-driven

ELECTRIC FURNACE OPERATION

Typical Charge	Pct
Fluxes, Carbon and Ore	5
Turnings and Borings	7
Home Scrap	20
No. 2 Baled Scrap	25
Miscellaneous Scrap (auto., etc.)	43

Typical Dust Emissions	Pct
Silica	2
Alumina	3
Iron	25
Lime	6
Zinc Oxide	37
Magnesium Oxide	2
Copper Oxide	0.2
Manganese Oxide	4
Phosphorus Pentoxide	0.2
Sulphur Trioxide	3

Particle Size, microns	Pct
0 - 5	71.9
5 - 10	8.3
10 - 20	6.0
20 - 44	7.5
Over 44	6.3
Specific Gravity	3.93


No. 3 Furnace
No. 2 Furnace
No. 1 Furnace
A - Water-cooled vent elbow
B - Flame trap, 2-pass
C - Louvre duct dampers
D - Spray conditioning tower
E - Water drop-out tower
F - Water drop-out tower
G - Motor driven fan
H - Precipitator by-pass
2 Unit precipitator

SCHEMATIC LAYOUT of components used to trap electric furnace smoke, dust and fume.

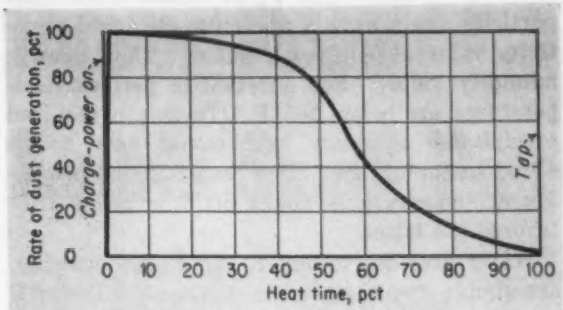
fan which pushes the gas and dust into the single two-unit precipitator serving all three electric furnaces.

The flame trap lowers peak temperatures of gases (by water sprays), to a point safe for the unlined steel ductwork. These traps are refractory-lined and two-pass to conserve space and provide sufficient time for evaporative spray cooling of gases. Temperature peak limits are automatically controlled by adjustable-range instruments generally set for 800°F maximum to operate a series of water fog sprays.

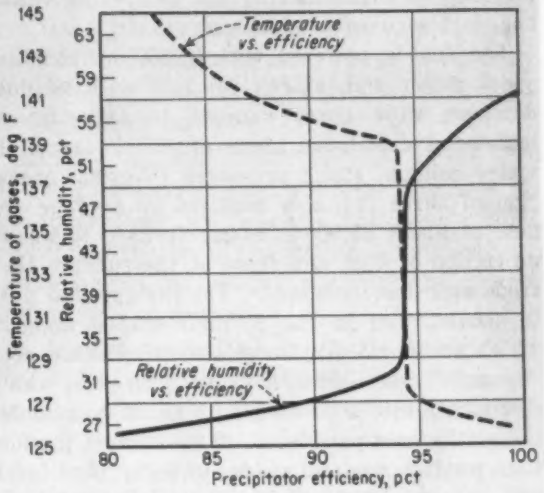
Louvre dampers in ducts permit automatic and/or manual push-button control of individual furnace pressure. Furnace pressures are controlled to provide a slight inward flow of air through the annular spaces around the electrodes at all times. To produce this effect required a pressure of minus 0.02 in. water column at inside crown elevation. The automatically controlled dampers prevent escape of dust, fume and flame from the electrode openings even when the working doors of the furnace are open.

The spray conditioning tower adds moisture to and cool the gases to a point where the electrical resistivity of the dust particles assumes a minimum value. Low temperatures and high moisture content are equally necessary for high precipitator efficiency. Acceptable precipitator efficiencies are not produced until gas temperatures fall below 127° with a critical point at 139°F. Relative humidity must be kept above 49 pct with a critical point at about 32½ pct.

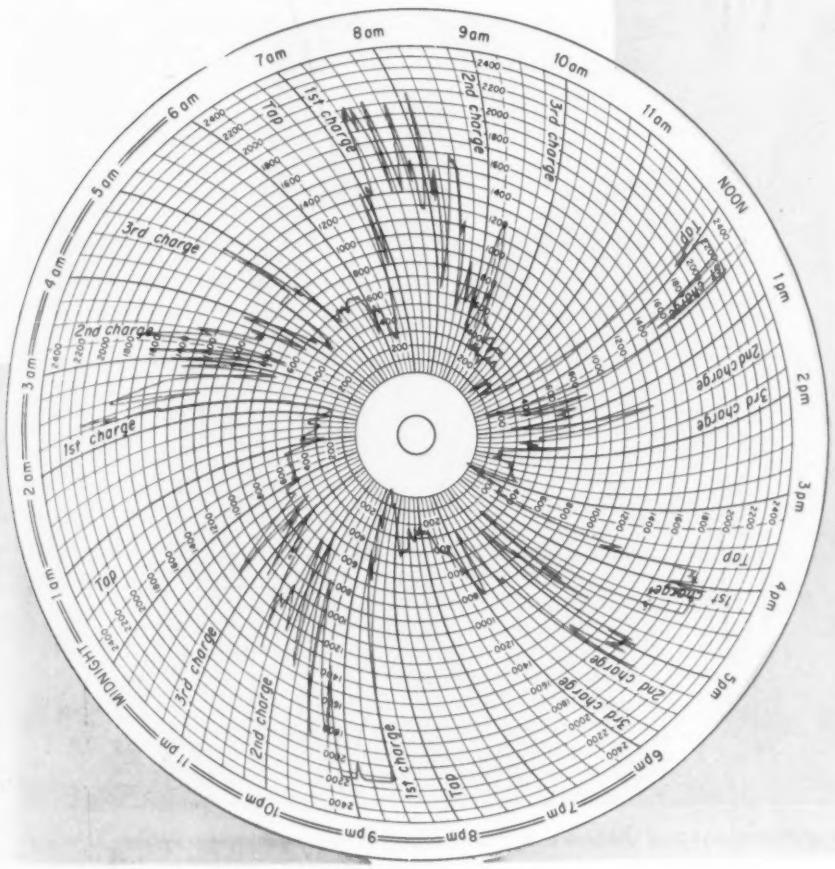
It is believed there is also a higher tempera-



MOST DUST, 75 pct by weight, is generated in the first half of electric furnace heat time.



PRECIPITATOR works best when gas temperature is below 127°F, humidity above 49 pct.



TEMPERATURES taken at annular openings over 24 hours rise and fall sharply during operation.

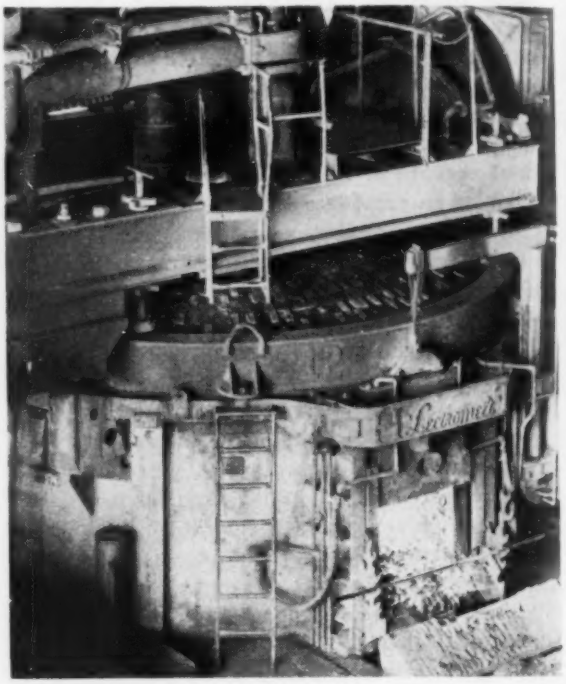
ture point, above 500°F, at which these dust particles again have a minimum electrical resistivity value also in combination with a relative humidity value. For substantial periods, temperatures are below 500°F. To obtain required precipitator efficiency heat would have to be added to the system. The economics of operating at temperatures above 500° or below 127° favored the latter.

Water drop-out towers E and F, see drawing, are simply "wide places in the road." Tower E was installed to slow gas velocity to a point where large entrained water droplets picked up in Tower D would be precipitated and run off through a bottom drain. Tower F, originally installed as a gas mixing and tempering chamber, is now used to slow gas velocity.

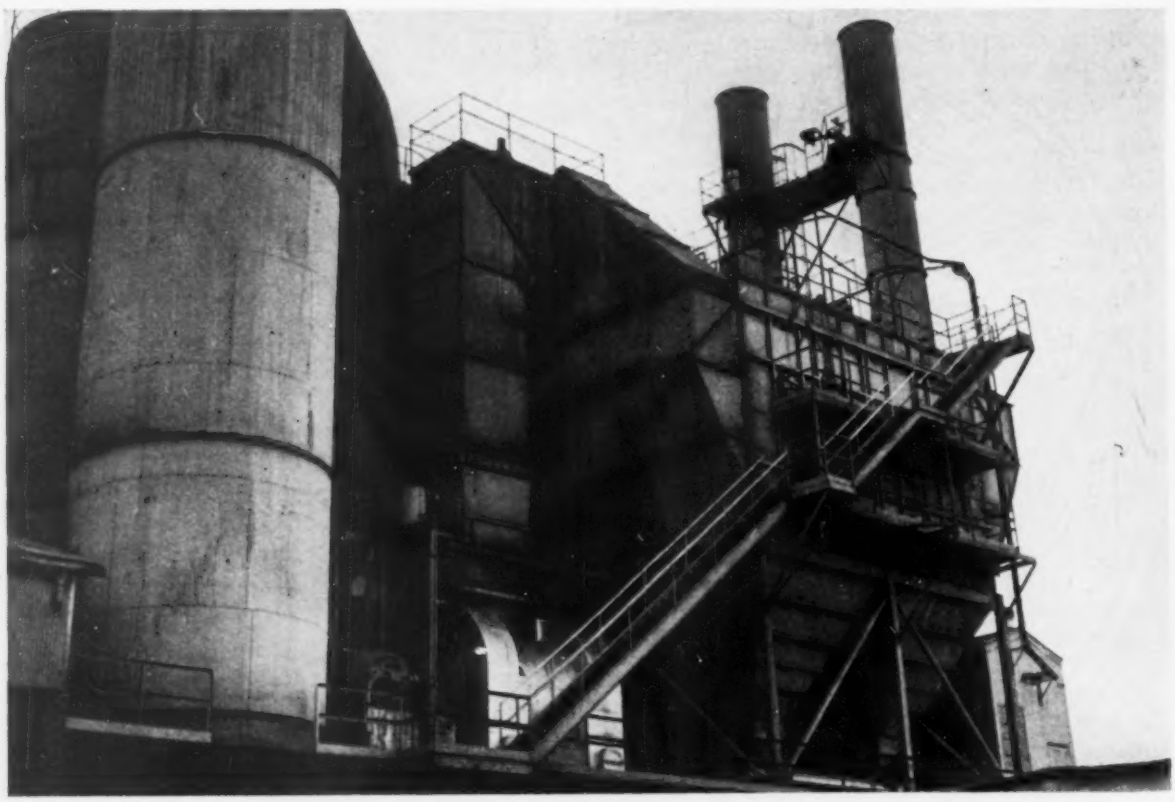
The fan is powered with a 250 hp constant speed motor and, at full capacity with all duct dampers wide open, handles 140,000 cfm of moistened dust-laden gases at 127°F and 8 in. water column, static pressures. Normal operation of three furnaces requires an average gas flow of about 35,000 cfm per furnace to insure no escape of dust and fume at the furnace electrode and door openings. The precipitated dust is accumulated in the pyramid-shaped hoppers which are emptied by interconnecting screw conveyors. These lead to a single drop pipe, which discharges into a covered auto truck tank under the platform at yard level. With current production, product mix and grades of scrap, dust catch will average 12,000 to 20,000 lb daily.

In normal operation no visible fume or dust issues from any opening or roof of a 75-ton furnace, even with power on and slag door open. A water-cooled dust collecting elbow communicates with a vent hole in the furnace roof.

The water-jacketed elbow is an effective means for drawing off all potential particle emissions from one central location. The elbow is supported on the furnace-roof superstructure and swings with the roof.



POWER'S ON and slag door open yet there is no visible fume or dust from this 75-ton furnace.



DUST is collected in pyramid-shaped hoppers which are emptied by screw conveyors.

FIG. 1—Typical workpiece showing separated knurls easily applied between flat dies.

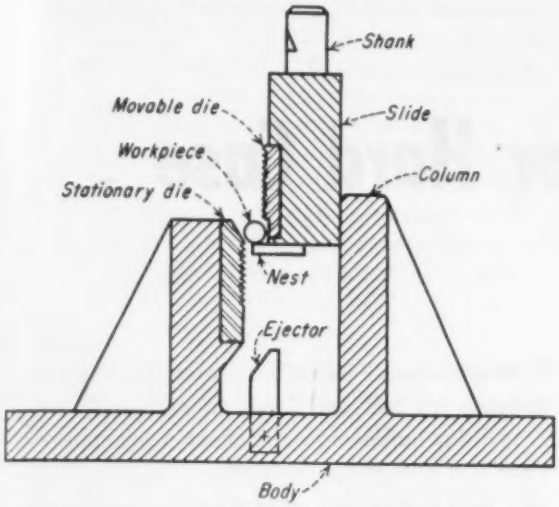


FIG. 2—Sketch of press setup and location of necessary parts for knurling round stock.

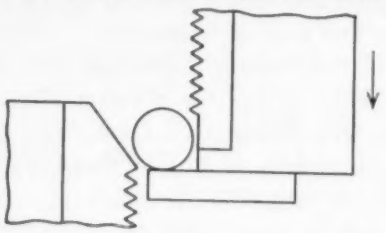


FIG. 3—Loading station for workpiece is formed by an incline at top of stationary die and a horizontal support below movable die.

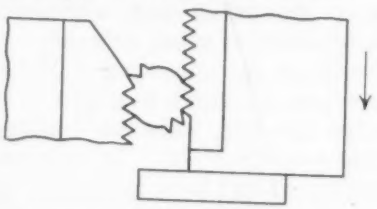


FIG. 4—Downstroke of movable die rotates the workpiece and forms knurled impression.

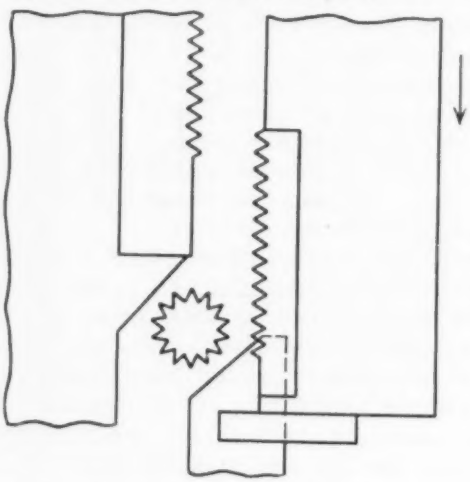


FIG. 5—Completion of movable die downstroke causes finished workpiece to be ejected.

Power Press Knurls Small Pieces at High Rate

◆ KNURLING of round pieces is usually done on a lathe, but it can also be done very successfully, and economically, on a power press built on the same general principles as a flat-die thread rolling machine.

Using ¼ in. bar stock, and the press and die setup described here, a production rate of 700 pieces per hr is easily attained. Time needed to complete the operation is independent of the length or number of separated knurls applied to the workpiece.

A typical workpiece is shown in Fig. 1. Fig. 2 illustrates a homemade press and die assembly. The press framework is a cast steel body with two vertical columns; one to support a stationary die; the other to support the press ram and movable die slide.

Tie rods between the columns (not shown in the sketch) are used to prevent spreading under the thrust load of the knurling operation.

The dies themselves are flat pieces of tool steel, with the knurling design applied by a milling machine, shaper or grinder.

In operation, with both dies in open position, the workpiece is placed in the loading station where it rests on a horizontal support attached to the bottom of the movable die carrier slide. (See detail sketch in Fig. 3.)

As the press is actuated, the movable die descends, pressing and rotating the workpiece between the two dies as shown in Fig. 4. When the movable die reaches the end of its travel the knurling operation is complete. The workpiece strikes the inclined plane of an ejector block and is diverted into a clearance space as shown in Fig. 5. The press ram then begins its upstroke and the finished part is removed.

Adjustments to the dies by means of screws and locknuts (not shown in the sketches) make it possible to accommodate various diameters of bar stock, and also provide for the correct depth of the knurling design to be applied.

The press tool described here was completely homemade; no special tools or equipment were used. The life of the tool is practically indefinite, only the dies being changed or replaced as required from time to time.

With ammonia—

Nitriding Produces Better Hard Case on Titanium

By J. L. WYATT
Asst. Technical Mgr.
Horizons, Inc.,
Cleveland

N. J. GRANT
Asst. Prof. of Metallurgy
Massachusetts Institute
of Technology
Cambridge, Mass.

◆ Titanium can't be used on wear applications because it's soft and tends to seize and gall. . . . Nitride hardening with ammonia will improve wear and anti-galling properties . . . Pure nitrogen, pack carburizing, gas carburizing and liquid cyanide were tried but were impractical.

◆ Ammonia flow rate is different for each temperature and time of treatment . . . For each treatment time there is a maximum case depth. Longer times reverse the diffusion effect and the case gets thinner . . . Case depth up to 0.004 and hardness up to 1700 Knoop were obtained in nitriding titanium.

◆ HIGH STRENGTH, light weight, and corrosion resistance are the good properties of titanium. Opposed are adverse properties such as low wear resistance and a marked tendency to gall and seize. To make titanium more widely useful, methods of overcoming these adverse conditions must be developed.

Work done at Massachusetts Institute of Technology and sponsored by Titanium Metals Corp. and the Titanium Div. of National Lead Co. investigated cyanide, pack and gas carburizing, straight nitrogen and ammonia nitriding.

Ammonia was found to be the best possible means of commercially producing a suitable case on titanium. Liquid cyaniding resulted in serious corrosion and was not effective in producing a hard case. Pack carburizing developed only an embrittled, oxidized skin and while gas produced a carbide surface it would not harden sufficiently to warrant exploitation. Nitrogen nitriding, although less effective than ammonia, can, with certain limitations, be used for hardening titanium.

Three major variables were found to be the controlling factors in the ammonia nitriding process. Temperature, time of exposure to the treatment along with composition and purity of the gas. All three variables had to be controlled exactly in order to achieve optimum hardening. In nitriding steel, the gas composition is not particularly important, but atmosphere for nitriding titanium is quite critical.

By selecting a constant treatment time and temperature, the ammonia flow rate was varied. An optimum flow rate produced maximum diffusion, and greater or lesser rates gave lower total diffusion when based on unit weight gain data. The optimum flow rate was thus determined for a series of temperatures ranging from 1350° to 1700°F, in 50° steps. The results are shown in Fig. 1 for the particular furnace arrangements used.

The ammonia flow rate has more practical significance than that of weight gain since at flow rates less than the optimum, the hardened case is quite porous. At higher than optimum flow rates, the case was dense but depth increased more slowly.

Using flow rates based on Fig. 1, a series of eight specimens was run at each of the temperatures selected. The time varied from 4 to 96 hr, in approximate logarithmic increments. Plots of unit weight gain vs nitriding time produced parabolic curves as shown in Fig. 2. The curves replotted as the square root of the weight gain vs nitriding time produced straight lines.

For each temperature there was a definite treatment time which produced a maximum thickness of hard case on the metal surface. Of

Editors note: An article describing many physical and mechanical properties of ammonia nitrided titanium, written by J. L. Wyatt and N. J. Grant, will appear in a subsequent issue.

complete tests run at 1395, 1445, 1495, 1545, 1595, and 1645 degrees F, only those run at 1495 and 1595°F are shown. Figs. 3 and 4 show the gradual increase in case depth with increasing time at temperature until a maximum is achieved, after which the depth of case again decreases markedly with time. Gradually a change in the core structure results in a very clear demarkation of the case on etching. Fig. 5 shows the Knoop hardness plots as a function of depth for the structures shown in Fig. 3. Although data shown were restricted to 96 hr, tests extended for 3 weeks continued to show decreasing case depth approaching a constant thickness of approximately 0.001 in. for these longer periods of exposure.

For each nitriding temperature, during which the optimum ammonia flow rate was used, there occurred this apparent reversal in diffusion effect. The table shows approximately the optimum ammonia nitriding time for each temperature, as determined from observations of hardness plots and photomicrographs.

Actually the ammonia flow rate is not in itself a variable, but is a measure of the relative amount of ammonia requirements at different temperatures. The effluent gases from the furnace when titrated in a standard acid solution, were found in every case to consist of approximately 0.1 pct NH_3 when the optimum flow rate was being used. Values ranged from 0.08 to 0.14 pct undecomposed NH_3, the percentage being based on the assumption that the incoming ammonia was 100 pct NH_3. An extensive drying train was utilized to remove all traces of oxygen-bearing gases, primarily H_2O.

Unless the ammonia was extremely dry, lower diffusion rates were encountered with correspondingly thinner diffusion layers. At the same time various purple and brown coats were formed on the metal surface, these were attributed to the formation of titanium oxide. When adequate purification of oxygen bearing gases was accomplished, a uniform gold-colored patina ranging from lemon yellow to dark gold was formed. This was determined to be 'TiN' (titanium nitride) by X-ray diffraction. The TiN layer was extremely thin, never growing more than 0.0004 in. thick and with a Knoop hardness up to 1700.

X-ray studies of cross-sections of specimens indicated that the useful hard surface layer formed as a result of ammonia nitriding was a hexagonal structure differing only slightly from the indices of alpha titanium, the maximum deviation occurring at a depth approximately 0.0006 in. below the treated surface. Both hardness gradients and lattice parameter gradients indicated that the hardening resulted from the nitrogen solid solution alloying of the alpha titanium. No compound other than TiN was observed in any of the nitrided specimens. In spite of the acicular-appearing core structure, which shows up after longer nitriding times, X-ray studies indicated the core to be a single phase. Heat-treating experiments illustrated that the size of the plate-like material was related to the rate of cooling from above 1450°F, much as austenite transforms to pearlite in steels. Chemical analyses of the core structures showed nitrogen contents ranging from 0.04 to 0.08 pct by weight. This core structure is prob-

TIMES, TEMPERATURES, FLOW RATES

Temperature Deg, F	Treatment Time, Hrs	Relative NH_3 Flow Rate
1350	Over 500	1.00
1400	150-250	1.17
1450	60-90	1.63
1500	40-60	1.90
1550	20-30	2.58
1600	10-20	3.63
1650	2-6	5.67
1700	Less than 2	6.72

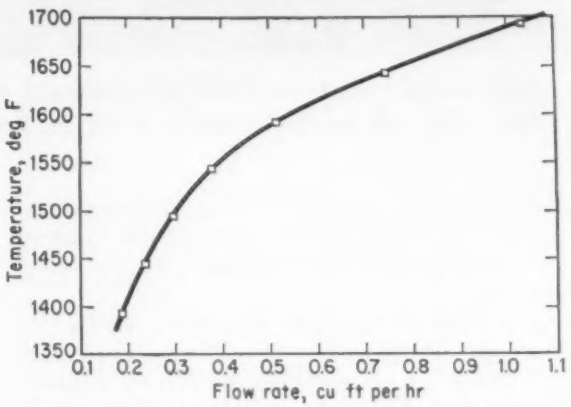


FIG. 1—Optimum flow rate of ammonia required for a particular temperature gradient.

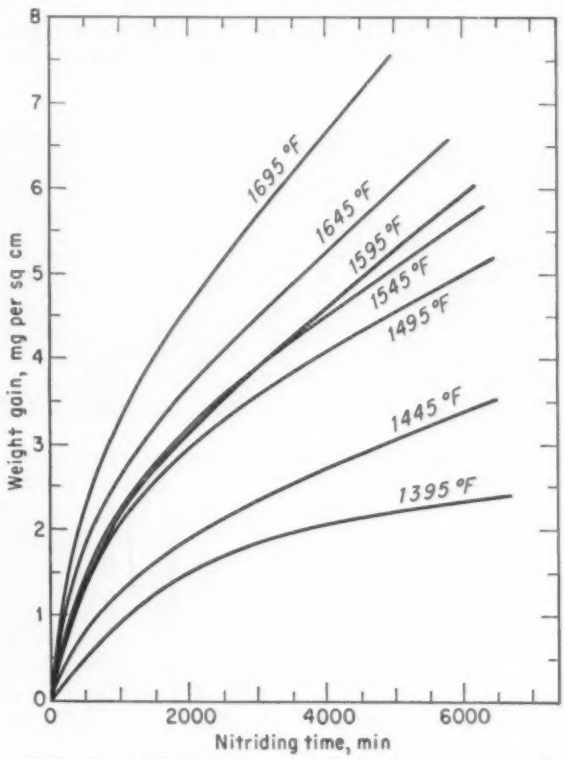


FIG. 2—Weight gain as affected by time and temperature in the nitriding of titanium.

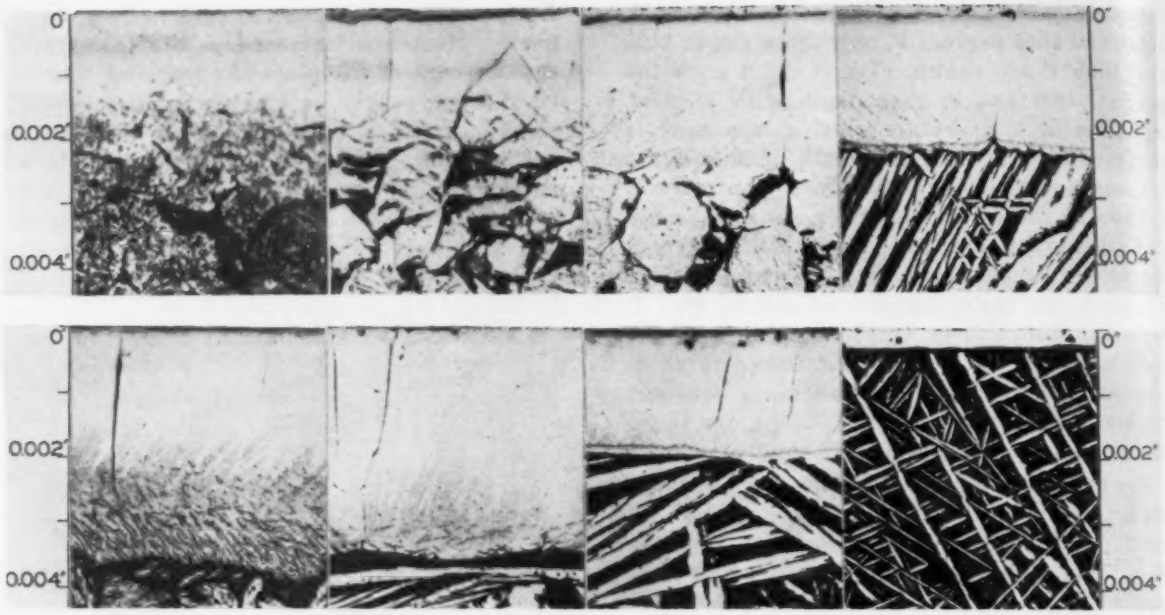


FIG. 3—Case and core (500X) of commercial titanium ammonia nitrided at 1495°F for various times: Top, left to right, hours, 4, 9, 16, 24; Bottom, left to right, 38, 48, 74, 96.

ably due to the presence of considerable quantities of hydrogen since it is not known to occur when nitriding is accomplished with dry nitrogen gas.

A series of titanium specimens similar to those already described were run using purified nitrogen gas as the surface-hardening medium. Weight gain data indicated that weight gain in pure nitrogen was approximately one-half that obtained under comparable conditions in the ammonia process.

Microhardness tests showed low values at comparable depths than those obtained with ammonia, and bend tests indicated a more brittle condition.

A relatively hard surface layer may be formed on titanium metal by exposing it to an atmosphere of pure nitrogen. For equivalent hardness, depth of penetration and similar core properties, the use of nitrogen instead of ammonia would detail furnace temperature approximately 150 to 200°F higher. Purification of the nitrogen to remove all oxygen poses a serious problem, requiring auxiliary and complicated purification trains.

An advantage over ammonia is that the flow

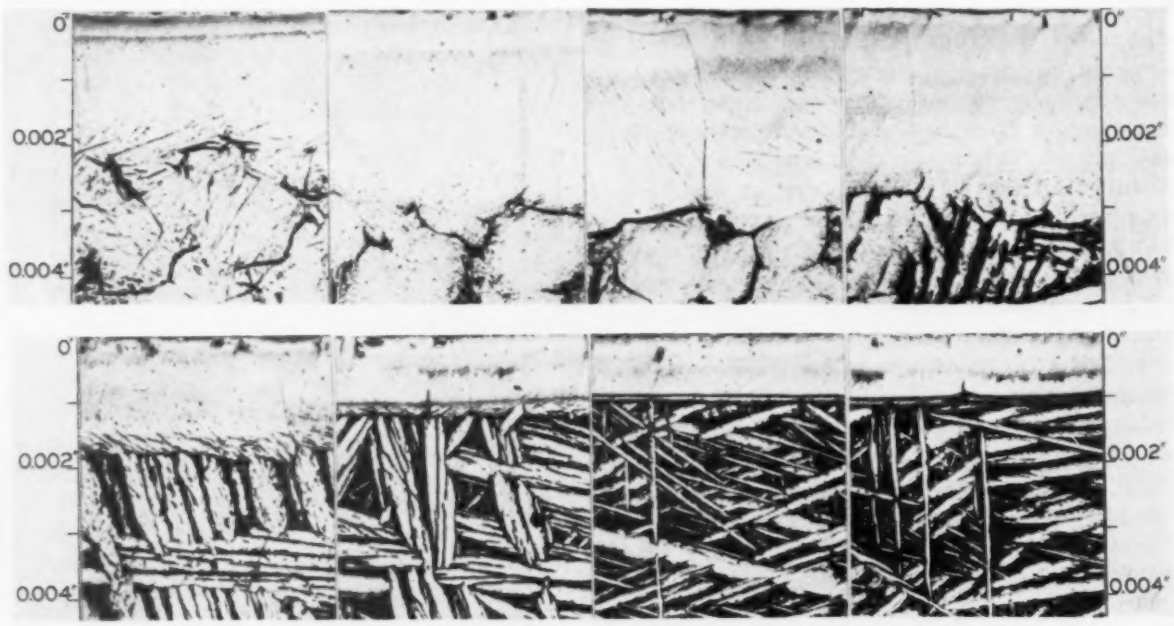


FIG. 4—Case and core (500X) of commercial titanium ammonia nitrided at 1595°F for various times: Top, left to right, hours, 4, 9, 16, 24; Bottom, left to right, 38, 48, 74, 96.

rate is not a function of temperature, and flow requirements do not have to be nearly as large as in the ammonia process. No hydrogen explosion hazard is present, and the incompletely known effects of hydrogen would not have to be contended with.

According to a recent patent, titanium may be surface hardened to any desired degree and composition by the relatively simple technique of immersing the material in a molten cyanide bath for a period of time. Since details were not available, an extensive program of evaluation was undertaken.

Five different series of specimens were treated, for times ranging from 5 minutes to 18 hrs and over a temperature range of 1200 to 1700°F.

It was found that in impure cyanide baths open to the atmosphere the rate of corrosion of the specimens was high; samples completely dissolved in less than 2 hr at 1600°F, and were severely corroded at lower temperatures. Even in pure cyanide open to the atmosphere the rate of corrosion was similarly rapid.

By using inert atmospheres, and atmospheres of ammonia, more favorable results were obtained but still not within the realm of utility.

The minimum corrosion rate encountered was approximately 1 pct, or 0.0012 in. per hr, a rate that could not be tolerated for most purposes.

On the basis of these data it was concluded that surface hardening of titanium by means of liquid cyanide baths was probably impractical, since under the best conditions the corrosion rate would eliminate the use of the process.

The feasibility of case carburizing titanium by means of pack carburizing techniques was investigated. To prevent titanium oxidization, high purity carbon black, evacuated at elevated temperature, was used. The specimen was carefully contained in a steel tube, surrounded on all sides by tightly packed carbon black. Periods of time ranging from 10 to 100 hr were utilized at temperatures varying from 1300 to 1700°F. Purified helium was passed through the furnace during the entire period of the runs.

All of the treated specimens were extremely brittle in bend tests, and the surface coating chipped when tapped lightly with a hammer, or when the specimen was dropped on a hard surface.

It was decided that even under the most careful conditions, oxidation rather than carburizing tends to occur. No evidence of titanium carbide formation was found in any of the specimens.

Gas carburizing shows difference

The relative merits of gas carburizing were evaluated in still another series of experiments using the equipment which was also used for ammonia nitriding.

The furnace was slightly modified so that high purity propane diluted with pure helium could be run through.

An excess of propane produced carbonization, while too lean a mixture produced lower unit specimen weight gains than desired. A practical limit of 1.95 pct propane by volume was finally arrived at for the series of tests that was ultimately run.

The thickness of the affected surface zone was disappointing, appreciable hardness increases were found only in specimens treated for more than 48 hrs.

In gas carburizing, the resulting product differed from that of other surface-treatment methods. A noticeable penetration into the core gave an entirely different core structure.

Use of propane not practical

X-ray showed that TiC was formed on the surface of the metal, producing a grey, easily fractured coating, with a maximum hardness near the surface of 540 Knoop. Bend tests indicated that the carburized specimens were extremely brittle, with no evident ductility.

From a practical point of view the use of propane to carburize titanium did not appear feasible on the basis of the limited amount of experimentation that was carried out. Furnacing difficulties were encountered, cooler portions of the furnace chamber becoming coated with a gummy substance due to thermal "cracking" of the propane. A liquid fraction also was formed that effectively clogged up exhaust ports, required lengthy furnace shut-downs for cleaning, and limited the length of any one treatment period.

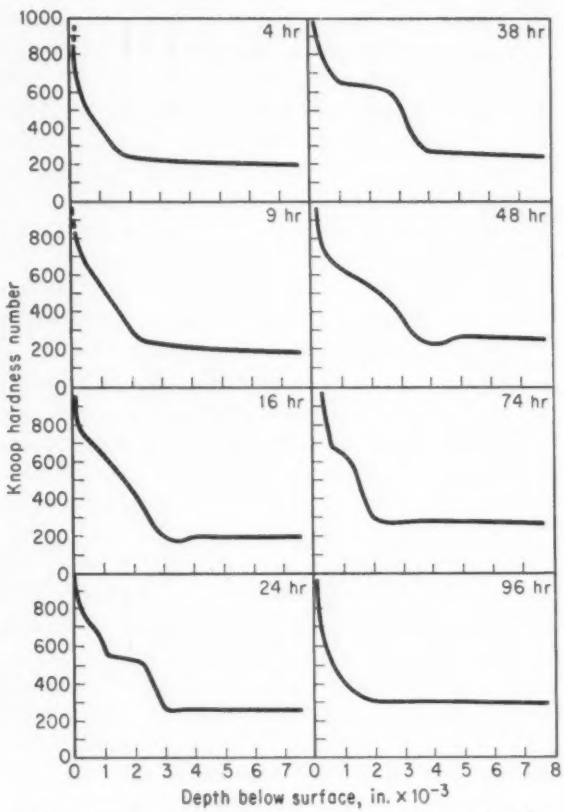


FIG. 5—Knoop hardness at various case depths on ammonia nitrided titanium at 1495°F.

All in the control—

INDUCTION HEATER Boosts Output of Brazed and Soldered Parts

By O. W. Noeske
Electronics Section
Allis-Chalmers Mfg. Co.
Milwaukee
and
W. F. Sickels
Allis-Chalmers Mfg. Co.
Chicago

◆ **Induction heating for soft soldering and silver brazing five joints of a thermostatic diaphragm has cut costs, increased production and reduced rejects . . . In a specially designed heating unit, temperature is controlled precisely . . . Equipment has assured uniform quality.**

◆ VACUUM-TUBE INDUCTION HEATERS can be used in many applications involving soft soldering and silver brazing on the same assembly. When an induction heater is interlocked electrically or manually to properly designed work coils and handling fixtures to operate from a pushbutton control, production increases, uniform quality is assured, and labor and material costs are reduced.

The Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, installed a 10-kw output Allis-Chalmers radio frequency induction heater for brazing and soldering three sizes of thermostatic diaphragms for automatic steam and fluid control equipment. By replacing the previously used heating equipment with the induction heater, the overall efficiency in soldering and brazing operations has been improved.

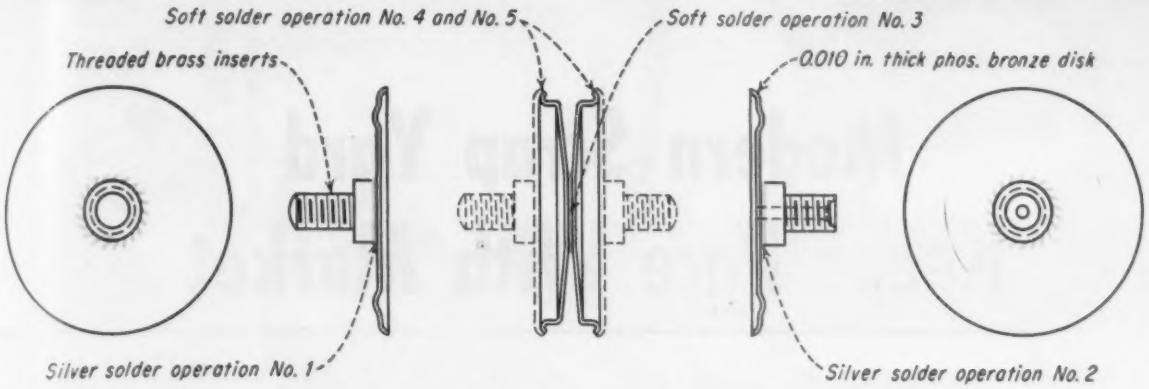
Each thermostatic diaphragm requires five separate brazed or soldered joints. Because the phosphor bronze disks forming the outer sides and internal bellows of the diaphragm are only 0.010 in. thick, precautionary measures had to be taken with regard to temperature control. Accordingly, the work coil was designed to incorporate chill blocks to effectively localize the radio frequency energy at the exact point of bonding. By doing this, any tendency of burning or distorting the thin metal has been eliminated.

The uniquely designed induction heating unit consists of a work table, two-station radio frequency switching mechanism, precise positioning devices and the specially designed work coils. Three sets of work coils handle all five brazing and soldering operations. Each operation is set up on its own holding fixture which includes the work coil and chill blocks.

The first and second operations consist of silver brazing machined brass inserts to the end disks of the diaphragm. The insert and disk are fluxed and a coined washer is replaced in the area to be silver brazed. Each work coil of the two-station switching mechanism is of the two-place type. Thus, while the two assemblies are being brazed simultaneously on one station of the radio frequency switch, the operator loads the other station. After brazing, the induction heater shuts off automatically.

From the pushbutton control, the operator energizes the second station. The output of the induction heater is thereby transferred from the first station and the brazing cycle begins. Meanwhile, the operator removes the brazed assemblies from the first station and reloads it for the next brazing operation. With this arrangement, production can continue virtually uninterrupted.

In the third operation, the male and female center disks are soft soldered to form the diaphragm bellows. Mating disks are fluxed and a 0.004-in. thick washer of 40-60 solder is placed between them. A single-place work coil is used on each station of a two-station switch-


Soft solder operation No. 4 and No. 5
Soft solder operation No. 3
Threaded brass inserts
0.010 in. thick phos. bronze disk
Silver solder operation No. 1
Silver solder operation No. 2

THERMOSTATIC DIAPHRAGM requires five soldered or brazed joints. Precise control of temperature is necessary to avoid burning or distorting the thin disks at the point of bonding.

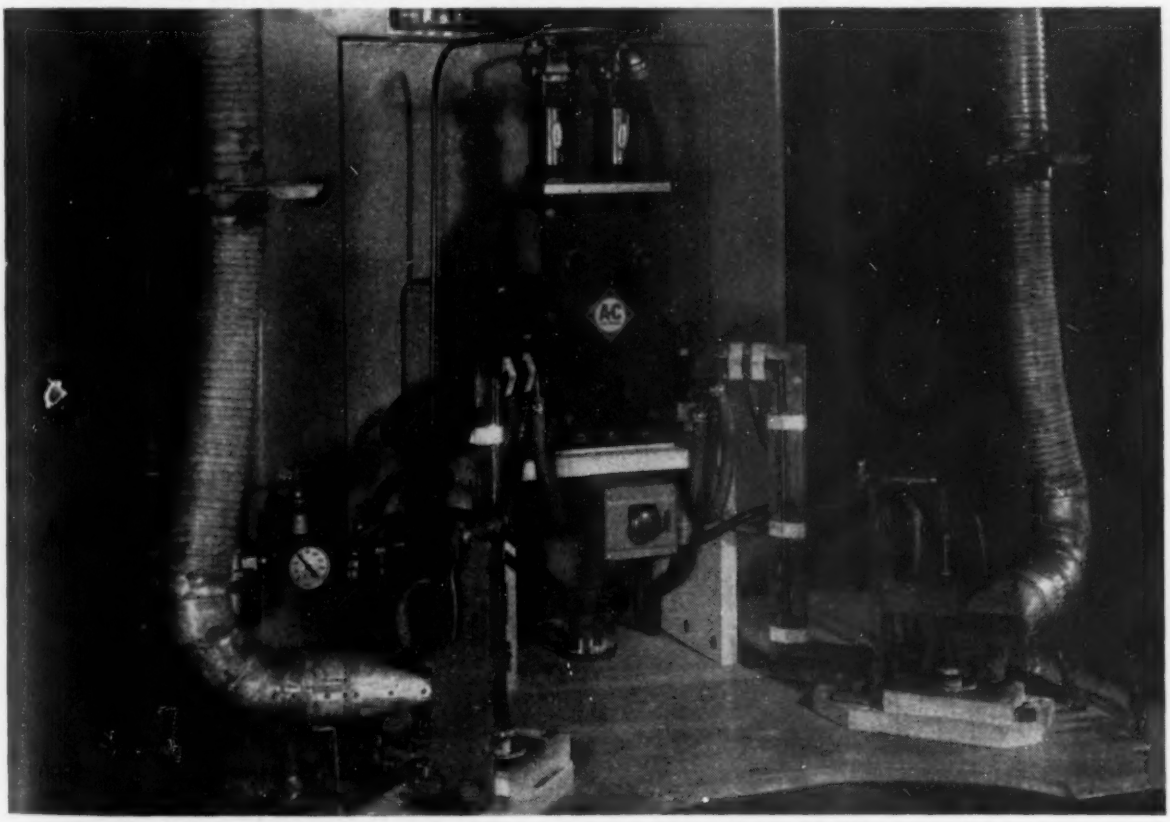
ing mechanism. The sequence of operation is the same as in the first and second operations.

The fourth and fifth operations involve soft soldering of an end disk assembly to each side of the diaphragm bellows. Parts are fluxed and a preformed wire ring of 0.045-in. diam 60-40 soft solder is preplaced at the outer diameter of the assembly. Soldering is performed in the same manner as in the first and second operations.

To complete the thermostatic diaphragm, the remaining end disk is soldered to the bellows. Assemblies are then tested to withstand a hydrostatic pressure of 200 psi.

Production control records show that 37 soft-soldered joints and 125 silver-brazed joints were made per hour using conventional heating methods. Rejects were many, cost of soldering materials was high, and nonuniformity was evident.

By installing radio frequency induction heating, the Illinois Engineering Co. now solders 65 joints and silver brazes 300 joints hourly. Rejections have been eliminated completely. Considerable savings have also resulted from the use of preformed rings and coined washers for soldering. They assure uniform joints and require a minimum of soldering material.



WORK HANDLING FIXTURE, completely interlocked with induction heater by pushbutton control, speeds soldering and brazing of thermostatic diaphragms. While one coil is in operation, the other coil is unloaded and reloaded. This setup more than doubles the previous output.

More than machines—

Modern Scrap Yard Keeps Pace With Market

By J. B. Schlossberg
Vice President
Max Schlossberg Co.
Chicago

◆ Today's scrap yard must be designed for speedy operation if scrap preparation is to coincide with a fast moving market . . . Mechanization helps, but machinery should be engineered for maximum speed as well as flexibility . . . Good arrangement of processing facilities and track layout are important to low cost handling of scrap.

◆ Automatic controls on machinery increase plant efficiency . . . Safety has an important influence on scrap preparation costs . . . Public address system and telephones throughout plant provide for quick intercommunication . . . Large stockpile area gives greater flexibility in meeting market conditions.

◆ SCRAP PROCESSING becomes more mechanized each day because the speed of scrap preparation must coincide with the ups and downs of a speculative market. In handling large tonnages of scrap, speed is even more important than cutting unit processing costs. It is common practice in the scrap industry to allow unit cost to increase if the number of units per hour can also be increased. A saving in preparation cost of $.50 per ton is of little value if the market drops $5.00.

Use of machinery is a partial answer to the problem of lowering unit cost and reducing preparation time. However, the mere replacement of manual operations by mechanized equipment is not enough. The machinery must be engineered for speed and flexibility so that scrap preparation coincides with a speculative market, and at a minimum unit-ton cost. This practice is being followed at the modern scrap yard of the Max Schlossberg Co., Chicago.

After analyzing the flow and handling of materials, several decisions had to be reached. One of these was to locate a railroad scale strategically within a network of tracks, allowing traffic to cross the scale from either direction. The track network was also laid out to allow for shuttling of cars to an unloading area as soon as they have been weighed.

Extra tracks have been provided to hold cars which cannot be unloaded because of short weight or other reasons. Storage of these cars does not interfere with normal operations. Since all cars are weighed twice, the scale must be accessible at all times. For this reason, extra tracks have also been provided for outbound loads and empties. Weighing is expedited by use of a traffic light to signal the crane operator, and an automatic weighbeam.

The routine procedure is to weigh and inspect incoming cars, switch them to the unloading area, return them to the scale for tare weight, and then either return these empties to a loading area or switch them on the outbound track. If empties are to be reloaded, they must be weighed again before being switched to the outbound track. This same careful planning of track layout is necessary in meeting track requirements for each machine installation.

Other than carload shipments of scrap arrive by truck. Although truck receipts are only a small part of total scrap tonnage, consideration for the driver requires quick and efficient scrap handling. An electric sliding gate, operated remotely from the weighmaster's station, admits the truck to a 60-ft platform scale. The automatic weighbeam provides a typed ticket for each truck. Drivers can observe the

ALL CONTROLS for the hydraulic press are conveniently located for the operator. Automatic signals warn of any irregular machine action. Panel also includes emergency stop buttons.

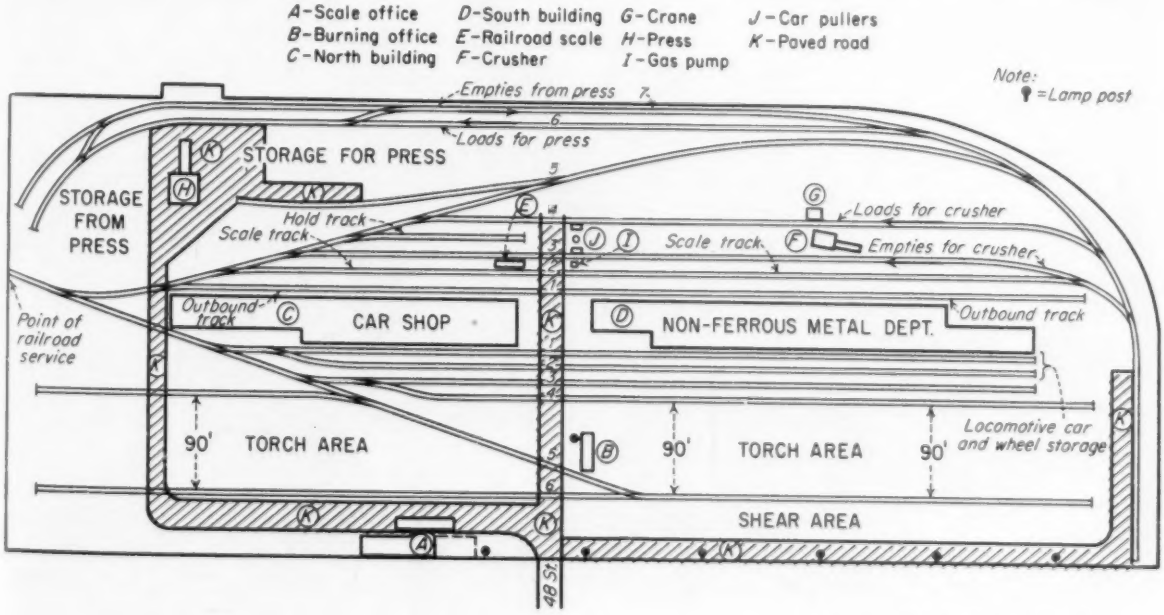
weighing operation through full-view windows.

Black-top roads throughout the yard reduce wear on truck tires. Roads are marked to indicate where driving is permitted.

The fingers of the business are the cranes which unload, handle and load the scrap. Because of the plant size and rail layout, diesel-electric locomotive cranes of 40-ton capacity are used for switching. With a 65-ft boom, they can unload 65-ft railroad cars without changing position.

Eighteen-ton snatch blocks and 55-in. magnets are used instead of 65-in. magnets for several reasons. Railroad tracks of 56½-in. gage must be kept clean. This would be difficult with a 65-in. magnet. With a 65-ft boom, the extra weight of a 65-in. magnet makes it more difficult to control. Although the 55-in. magnet carries less material, more swings can be made per hour. The heavier construction of the 55-in. magnet makes it less susceptible to damage.

As in most yards, scrap is prepared with a hydraulic press. It is one of the largest standard presses made. By moving the control booth



TRACK NETWORK and layout of work areas speed preparation of scrap, add flexibility to operations at yard of Max Schlossberg Co. Less-than-carload shipments arrive by truck.

closer to the press box and raising its height, the operator has better vision.

The air compressor is of the water-cooled type. An electric solenoid valve shuts the water off when the machine is stopped. When the machine is in operation, an automatic control maintains water temperature at 100°F. If water temperature reaches 135°F, water is shut off automatically. The air compressor also has a visual crankcase oil-level indicator and a visual automatic bearing lubricator.

Three 1000-gal underground tanks hold the fuel oil, drain oil and hydraulic oil. These oils are transferred automatically as needed. The pump which pumps hydraulic oil from the underground storage to the surge tank also handles oil accumulated in the pump body.

All controls mentioned are connected with a panel located alongside the operator. Lights and buzzers signal every irregular machine action. Emergency stop buttons, ventilation controls and lights are also included in the panel.

Hydraulic oil is not only filtered, but purified. Power fans provide a complete change of air ten times per hour in the pumphouse, control room, and the machinery pit. By the use of valves, air is reused on the reverse side of any movement in air-operated equipment. This increases efficiency and speeds handling operations.

Three sides of the press are accessible to the operation—the fourth side has the pumphouse adjoining. Scrap to be pressed comes from cars, trucks, or the stockpile. The amount of scrap from these three sources determines the physical layout. The black-top area around the press allows free flow of truck traffic. Up to 20 railroad cars can be moved at a time on the 1000 ft of double track with two interchanges.

An open area 90 ft wide, bordered by 1000 ft of track, allows stockpiling of 10,000 tons of scrap. Bundles are loaded when they are produced, but if necessary they can be stored in a 1-acre storage area adjoining the truck approach. This arrangement gives the flexibility necessary to meet market conditions. Stockpile areas are macadam to prevent dirt or mud from clinging to the scrap.

The turning crusher is set up as a carload operation only. Crushing of an inbound car directly into an outbound car permits control of chemical analysis. When truckload shipments are combined to make up a carload, chemical analysis throughout the car may not be consistent.

The crusher is mounted so that the hopper top is at about car-top level. At this level, a steel

CRUSHER HOPPER was built at car-top level to eliminate need for a pit and allow chip-removal from beneath crusher. If crusher becomes choked, an electric horn signals the operator.

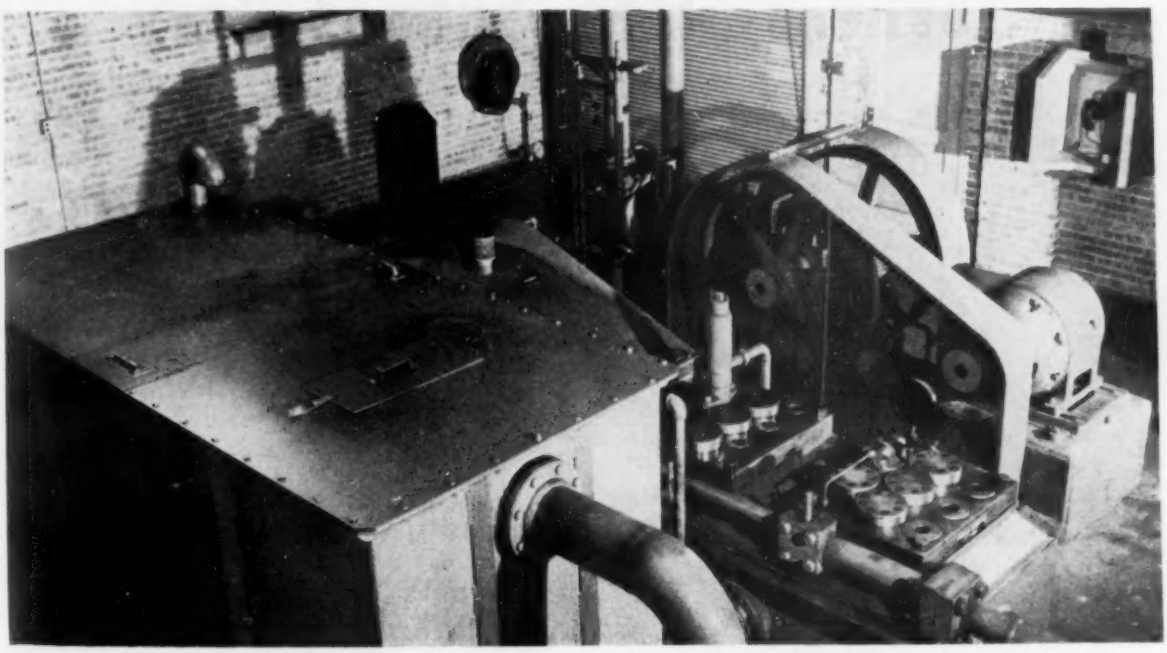
deck protects the motor, controls and crusher below. This height also allows for a chip-removal conveyor belt beneath the crusher, eliminating the need for a pit. The chip conveyor rises to a height of 26 ft and dumps into a car. Distance between rails bordering this machine is 30 ft.

Cars to be processed are placed on one track, and empties to be loaded are placed on another. Two car pullers 400 ft away, but controlled at the crusher site, move each string of cars when required. Unloading is done by an electric revolving crane, mounted 14 ft above ground level, giving the operator a full view of the car and crusher hopper. Because the crusher can be choked with too much material, an electric horn sounds when the motor speed drops below a predetermined level.

Alligator shears are located near the torch area and separated from it by a track which permits cranes to unload material into either area. The shears are capable of cutting up to 5-in. carbon rounds. A twin power takeout allows high-speed operation when desired. Anti-friction bearings make this speed change possible. These shears are portable, tapping into a 1000-ft long aerial power line.

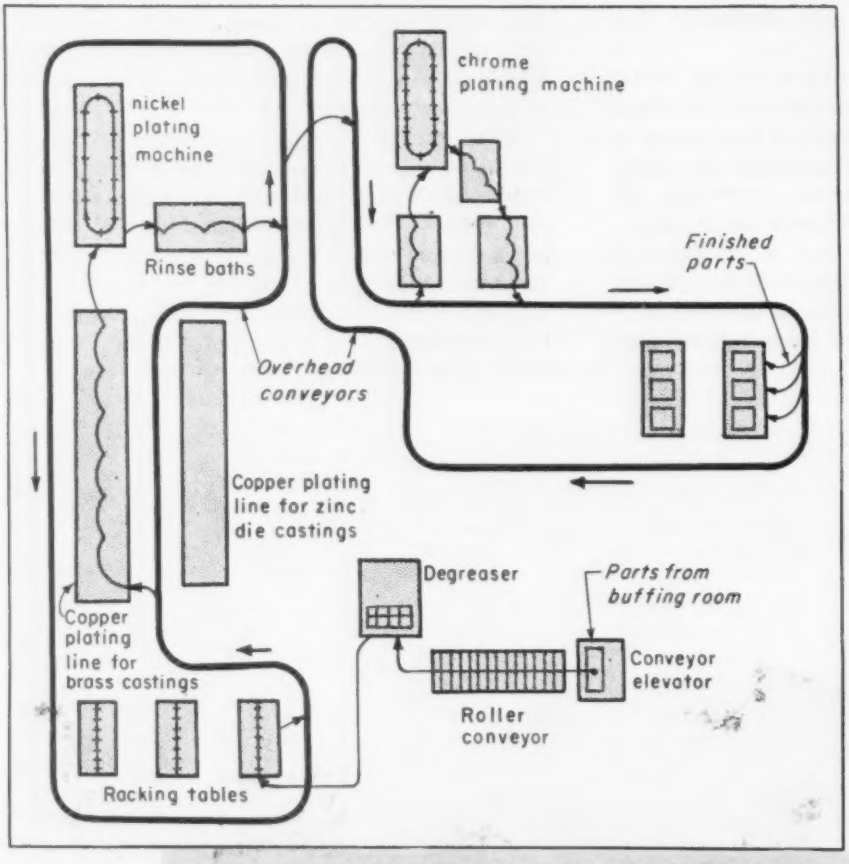
Most machinery is powered by electricity. All wiring is underground, and the entire plant is equipped with circuit breakers. The main motors receive their power from a central electric control room where voltage and amperage variations are held to a minimum by controls built into the main switchboard. Public address systems and telephones throughout the plant speed intercommunications.

FINGERS of a deisel-electric locomotive crane handle scrap at the hydraulic press. All yard operations are within easy reach of these 40-ton cranes which are used throughout the yard.



PUMP HOUSE MACHINERY supplies power for one of the largest standard hydraulic baling presses. This equipment has been engineered for top operating efficiency.

Output high, rejects low—



SEMIAUTOMATIC PLATING LINE at Speakman Co. provides the flexibility, output and quality required to plate about 3000 different parts. Production is about 22,000 parts per day.

Semiautomatic Plating Pays Where Sizes, Shapes Vary

By T. Stoddard
Foreman of Finishes
Speakman Co.
Wilmington, Del.

◆ Semiautomatic plating offers economy, high production and good quality in shops where parts vary in shape, size and finish . . . At Speakman Co., where about 22,000 shower heads, valves and other plumbing fixtures are chrome plated daily, rejects are down to 0.03 pct.

◆ About 3000 different parts are plated . . . Setup and handling methods may appear costly, but actually cost less than stripping, rebuffing and replating rejects.

◆ NEED FOR HIGHER OUTPUT of chrome-plated showers, shower heads, valves and other plumbing fixtures at Speakman Co., Wilmington, Del., required a major overhaul of the plating room. To convert, it had three alternatives. It could have continued present manual operations, but on a larger scale. It could have gone to a fully-automatic system. Or, it could have adopted a semiautomatic system to combine the advantages of both manual and fully-automatic operations. It chose the latter method.

Expansion of manual operations was quickly discarded as a possibility because it did not offer the technical or economical benefits of present-day methods for the size of operation contemplated.

The fully-automatic system, too, was ruled out because Speakman plates about 3,000 different parts in a variety of sizes and shapes. Some require special handling to obtain the desired

finish. In addition, both brass and zinc are plated and different steps are required in plating each of these metals. For these reasons, the fully-automatic system would not offer the flexibility necessary for quality output. Furthermore, this would be the most expensive setup.

The semiautomatic setup would give the added production required and produce the high quality product demanded. This contention has since been borne out by the fact that Speakman now plates up to 22,000 parts per day and has a reject rate of less than 0.03 pct.

Planning eliminates idle time

In designing the semiautomatic system, mechanized equipment was specified for two major plating operations. Other operations are performed manually. The chrome plate and the preceding nickel base coat are applied in semiautomatic machines. In these two plating steps, parts must be left in the tanks for several minutes. If tanks were batch loaded, operators would be idle while actual plating took place. Also, tanks would be idle during loading and unloading operations. With semiautomatic equipment, men and equipment are kept busy during the full time.

Parts are hung on an endless conveyor which moves them through the bath. Operators add and remove racks as the conveyor moves past the loading station. At the same time, the tank remains loaded.

Other steps require only that parts be dipped. There is no appreciable idle time for either men or tanks. The manpower provides the flexibility needed. The combination of these two methods results in economy, high production and good quality.

Parts to be plated are moved from the buffing department on the floor above by a vertical tray conveyor. Metal baskets containing the buffed parts are rolled on and off the vertical conveyor automatically and onto a roller conveyor. An operator at the end of the conveyor then places the baskets on a degreasing machine conveyor.

After degreasing, the baskets and parts are stored near the racking station. When scheduled for plating, parts are hung on 2½-ft-long racks. Each part has a special rack designed for its particular contour. Loaded racks are hung on an overhead conveyor which services the racking station, the copper-plating line, the semiautomatic nickel-plating tank and a reracking station.

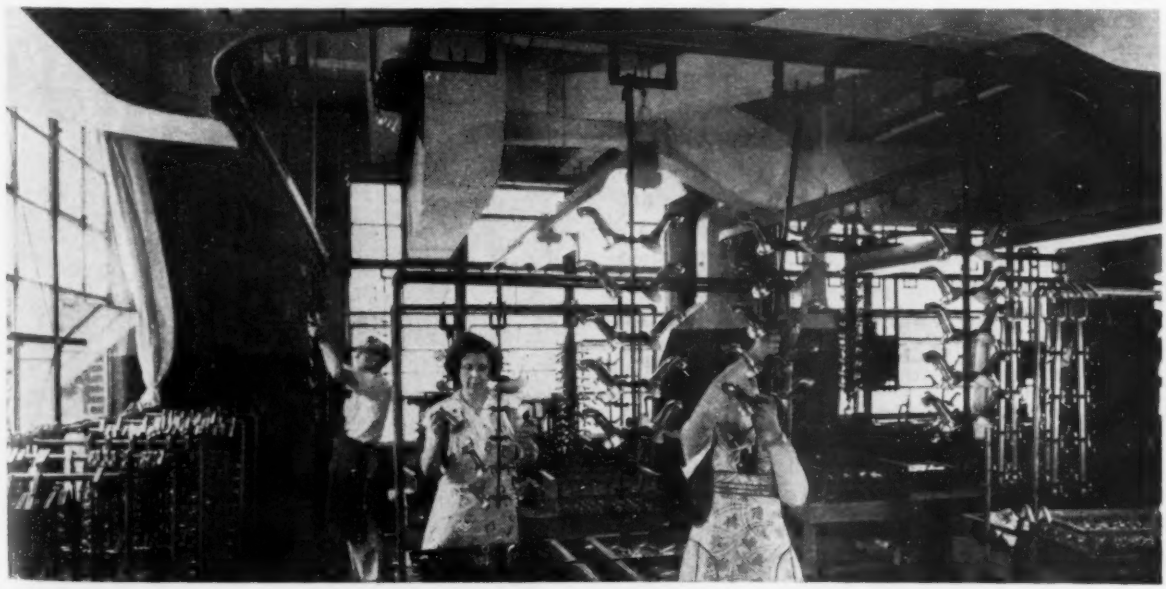
Racks are taken off the conveyor when they reach the manually-operated copper-plating line. Parts are first cleaned in alkali for 20 sec. This is followed by reverse alkali cleaning for 5 sec, a cold-water rinse in an air-agitated bath, a dip in a 20-pct sulfuric acid solution and a final rinse.

Copper plating is done in a Rochelle strike bath, after which the parts are rinsed. They are then dipped in a 15-pct sulfuric acid neutralizing bath, then rinsed again. Racks are moved from tank to tank manually since cleaning and rinsing only involve dipping. There is no appreciable time lost while reactions take place.

Nickel plating is mechanized

Zinc diecastings are also copper plated, but the processing steps differ. These parts are given a reverse alkali cleaning, then a rinse, a dip in a 1 to 2-pct sulfuric acid solution, and another rinse. Racks and parts are next dipped in the Rochelle copper-strike bath. This is followed by a rinse, a Wes-X bath which puts on a 0.0004 to 0.0005-in. copper plate, and two more rinses.

After copper plating, brass and zinc parts



RACKING STATION is storage area for racks and parts. As parts are scheduled for plating, they are placed on racks specially designed to handle the particular contours of the parts.

are treated alike in the nickel plating process. This is the first mechanized plating operation. Racks taken from rinse baths are hung on the conveyor of a 30-ft semiautomatic nickel plating machine installed by Hanson-Van Winkle-Munning Co. The endless conveyor automatically moves the racks down one side of the tank, around the end, and back along the other side so that plating is a continuous rather than a batch operation.

Parts receive a bright-nickel finish from a H-VW-M 9-H bath. After 6 min in the bath, the deposit is 0.00015 to 0.00020 in. thick. When the parts have made a complete circuit, the operator removes them from the bath, rinses them in a dragout tank, then in a hot-water bath. He then hangs the racks on an overhead conveyor which takes them to a reracking station where the parts are unracked. Empty racks are hung back on the conveyor for return to the original racking station for removal and storage. The operator then reracks the parts and hangs the racks on a second overhead conveyor which takes them to the chrome plating tank.

Extra care keeps rejects low

Before chrome plating, holes which would cause gassing and improper plating are plugged with corks. The reracking prevents the nickel solution from being dragged into the chrome bath and contaminating it. This manual step is essential to high quality and a low reject rate, and another reason for the semiautomatic system.

When racks reach the chrome plating line, an operator removes them from the conveyor and dips the parts in a 15-pct sulfuric acid bath. This is followed by a rinse. Racks are then hung on the conveyor of the 20-ft semiautomatic chrome-plating machine. During 2½ min in the bath, parts are given a 0.000015 to 0.000020 in. coating. Current density may be changed as many as 10 or 12 times a day, depending on the size, shape, and number of parts to be plated.

After chrome plating, racked parts are dipped manually into a dragout tank, then given a weak alkali dip. This is followed by a rinse and a hot water dip which speeds drying. Racks are then hung on the overhead conveyor and carried to the unracking station where finished parts are removed and packaged. Seven operators, each trained in all phases of plating, run the three plating lines. Six other operators work at the three racking stations.

A major reason for the exceptionally low rate of rejects is the thorough cleaning given all castings. Brass castings receive both direct and reverse alkali cleanings for better adhesion of the plate. Another reason for the low reject rate is that plating solutions are given daily additions and are analyzed at least once a week.

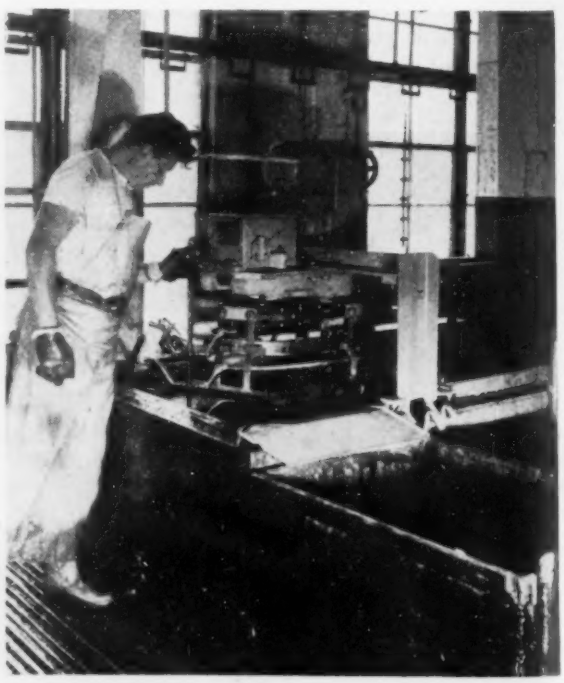
The extra care to obtain quality work seems expensive but the cost of stripping parts from a contaminated bath or rebuffing of parts is far more costly. Brass parts are given a copper flash which many platers omit. The copper flash is useful since it gives the nickel plate better adhesion on parts having sweated joints.

For good housekeeping, concrete floors in cleaning and plating areas are 18 in. below the regular floor level. The floor is acidproof and is drained off by four 6-in. drains. The regular floor level is covered with duck boards which have been treated to protect them from acid and alkali solutions.

The sides of all tanks are painted Everjet black. In addition, tank fronts exposed to dripping liquids have protective coverings. This innovation consists of bumper boards, painted Everjet black, spaced about an inch from the tank front and covering the entire front. A piece of rubber tubing runs along the top edges of the tank and bumper board. Dripping liquid spills on the rubber and flows down the bumper board, avoiding contact with the tank front.

Before plating, all parts are buffed. Depending upon size and shape, work may be buffed on any one of 16 hand-buffing machines, 12 semiautomatic machines, or one fully-automatic machine. Semiautomatic and automatic units are equipped with special jigs and fixtures to enable mass buffing with a minimum of hand labor.

Grinding is performed with abrasive belts and setup wheels, when required. Belts of 80 to 180 grit are used for 90 pct of all grinding. All parts requiring a bright finish are buffed with tripoli composition.



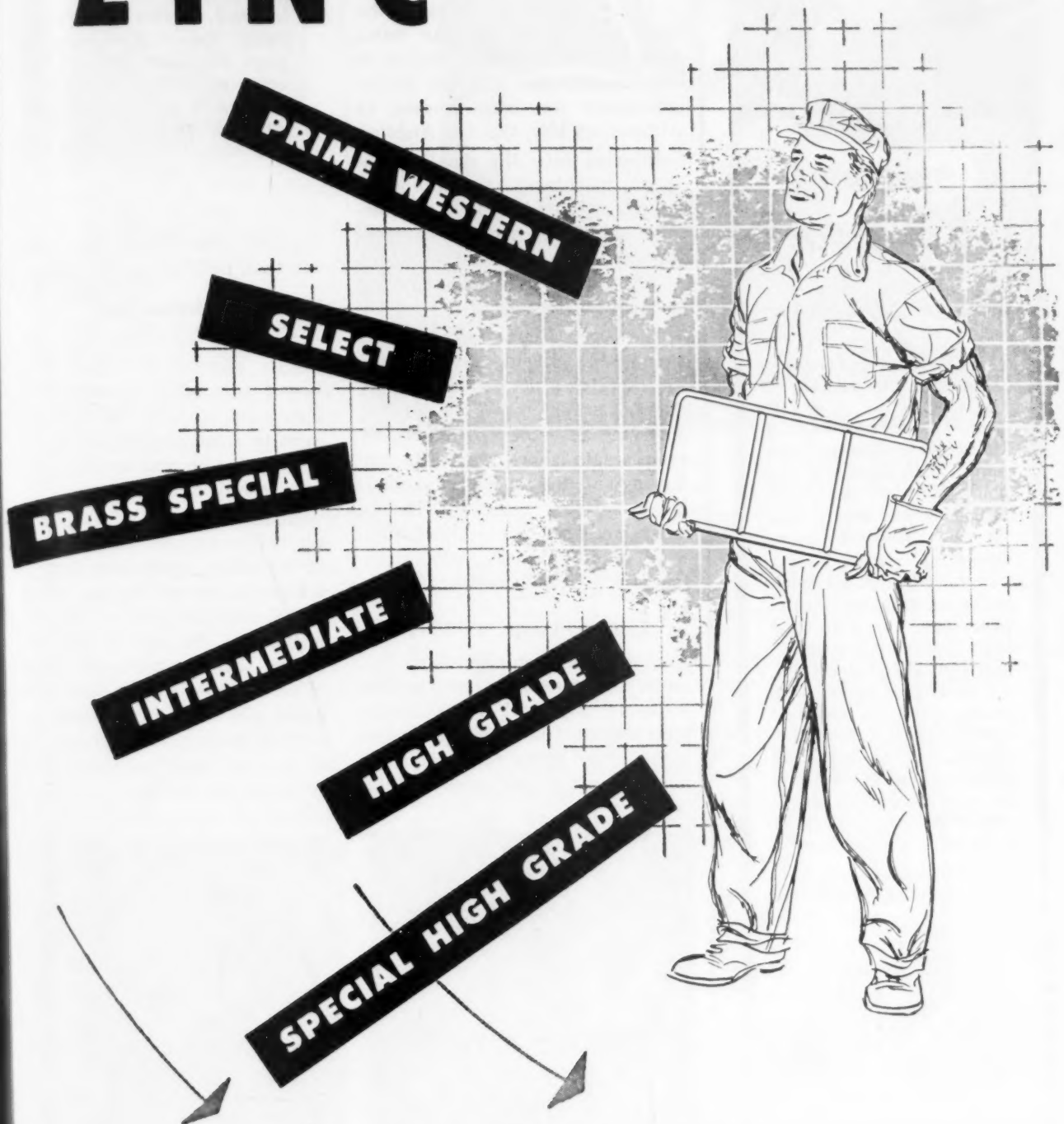
ENDLESS CONVEYOR of this 30-ft nickel plating machine keeps parts in solution for 6 min to apply an 0.00015 to 0.00020 in. thick deposit.

SLAB ZINC

every grade of **ZINC**

for urgent military and

civilian requirements



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Distributors for

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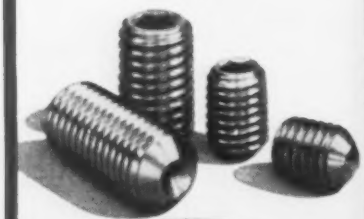
Allenpoint

Set Screws

WITH
SCIENTIFICALLY-DESIGNED
SMALLER CUP POINTS

Tested comparatively by United States Testing Company* with standard cup point screws and screws with angled and serrated points, the new Allenpoint demonstrated (1) greater locking power at *all* measured installation vs removal torque pressures, (2) uniformly high shaft holding power in torque resistance tests, (3) unmatched performance under vibration, and (4) more complete shaft contact pattern. Sold *only* by leading Industrial Distributors. Write for more facts about the results of these important tests of set screw performance.

**Report No. E 5576, March 17, 1953.*



ALLEN
MANUFACTURING COMPANY
Hartford 2, Connecticut, U.S.A.

Technical Briefs

Miniature:

Tiny probe used to measure high speed air flow.

A tiny, total pressure probe, built on a jewelers' type lathe, from 0.072 and 0.018 in. tubing, to measure air flow through turbomachinery, has been devised by AiResearch Mfg. Co., Los Angeles.

Inserted into the small, high-speed machinery, the probe, a miniature reproduction of the common, larger external probes, measures total pressures within a cone of 100° and at velocities reaching the speed of sound.

The probe had to be small enough to prevent disruption of the rapid flow of air through air ducts. Larger probes would not only turbulate the air, but would even create shock waves in air flowing at the speed of sound. Since suitable recording instruments could not be purchased, they were created in the AiResearch instrumentation laboratory.

Cannot Disrupt Air Flow

A delicate forming tool on the Levin lathe cuts the proper angles in the 0.012-in. wall of the tube to form a venturi section. This makes possible an accurate reading of the air flow from any angle within the 100° cone. The inside surfaces are then polished on the lathe.

Pierces Wall

An 0.018 tube from a hypodermic needle pierces the wall of the larger tube and curves into the airstream to carry the total pressure to a monometer, where it is recorded to be read by test laboratory technicians.

AiResearch, one of the largest aircraft accessory manufacturers in the world, specializes in miniaturization. By making possible internal instrumentation of turbomachinery, the use of the probe allows them to make corrections in air flow design and further improve efficiency of the small gas turbine motors, refrigeration turbines and other small air and gas turbines they build.

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 81. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Needle:
Measures air flow . . .

Patience, care:
Needed in close work . . .

AiResearch has been able to find many delicate, precision uses for the Levin lathe to make test equipment and produce small parts at tolerances far closer than in the finest watch.

Shape Soapstone Coil Forms

Some of these operations are lap-winding armatures for vibration pickup coils that measure turbine wheels within five-millionths of an inch, shaping soapstone coil forms and spinning silver tubing for thermocouple shields.

Shipping:

Packing container standardization helps cut costs.

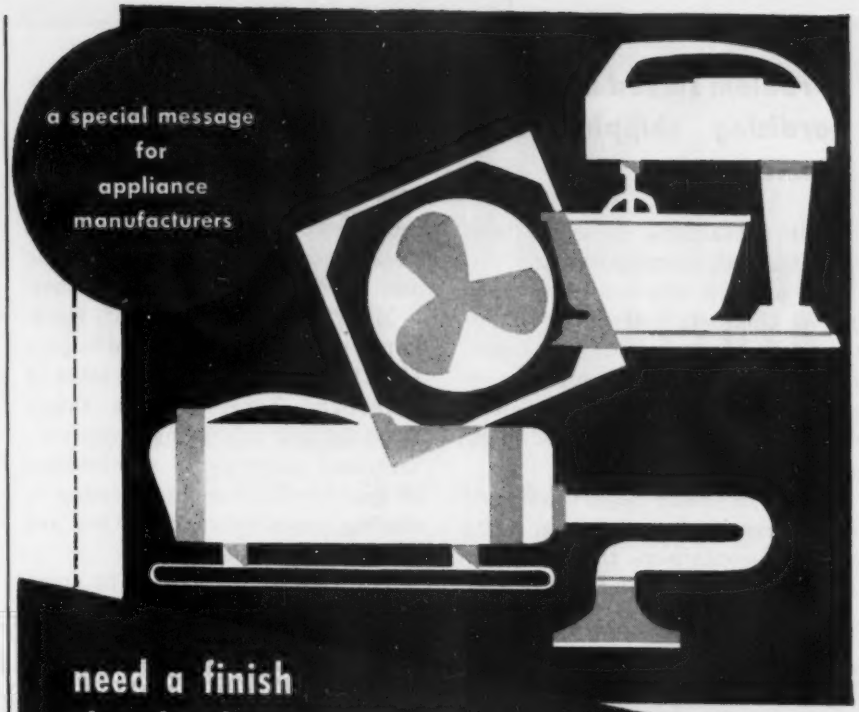
Packing for export used to be a problem at the Louisville, Ky., plant of Tube Turns, Inc. The company is a manufacturer of seamless welded fittings for piping in over 4000 different types, sizes, metals, and alloys. They are shipped all over the world for use in hundreds of different industries under every conceivable climatic condition.

Formerly all export shipping containers were made by Tube Turns from heavy lumber bought on the open market and then cut to size and nailed together to fit individual shipments.

This meant lack of standardiza-

Wirebound boxes tried . . .

Turn Page



need a finish
that blocks corrosion by itself—or under paint? *specify* IRIDITE

You can solve any problem of non-ferrous finishing . . . maximum corrosion protection . . . sparkling clear or colored decorative finishes, firm and lasting base for paint . . . with these two words—"specify Iridite". For example—

- **ON ZINC AND CADMIUM** you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed-colors.
- **ON COPPER . . .** Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.
- **ON ALUMINUM** Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.
- **ON MAGNESIUM** Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

AND IRIDITE IS EASY TO APPLY. Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

WANT TO KNOW MORE? We'll gladly treat samples or send you complete data. Write direct or call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

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Problem solved by standardizing shipping containers . . .

tion in containers, excessive tare weights, high container costs.

The problem was solved by making a complete survey of Tube Turns, Inc., export shipments and packing. As a result, the company adopted just three different sizes of wirebound boxes to pack most company export products.

Based on traffic department reports, the wirebound boxes, compared to containers the company formerly made, reduced shipping tare weights by two-thirds, displacement by 25 pct, and over-all packing-for-export costs by 70 pct.

Standardization of containers also has resulted in faster and more economical handling of packed containers, more profitable use of factory space and labor.

More economical use of warehouse and storage facilities is possible because the standard sizes of wirebound boxes can be safely high-stacked according to predetermined patterns in a minimum of space, and economy of space in storing containers before they are assembled for use.

The drastic slashes in tare weights, displacements, over-all packing costs, and shipping damage have permitted reductions in delivered costs abroad. Other advantages are lower freight charges, lower marine insurance rates and reduction of the expense that accompanies settlement of damage claims.

For shipping elbows . . .

Handling:

Scrap yard rebuilds crane with diesel power.

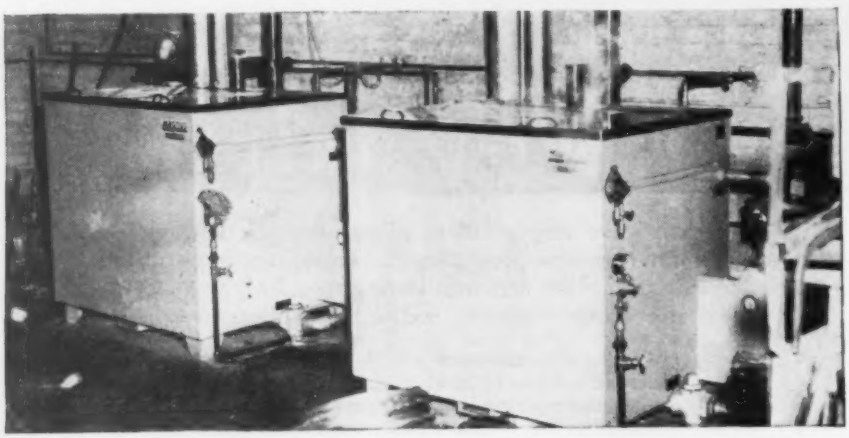
Savings in locomotive crane investment and operation costs have been achieved by Deitch Scrap Yard, Sharpsburg, Pa., by buying a junked steam powered crane and installing a modern diesel engine and Morse Hy-Vo drive power transmission unit.

The 40-ton McMyler crane was bought at junk price and disassembled by Deitch mechanics. The 2-cylinder steam engine power unit was removed and a modern Cummins 225-hp diesel engine with a Twin Disc Torque converter unit installed.

Compact Unit

An economical, heavy duty, high speed reduction drive between the engine-torque converter unit and the crane gear units was provided by installing compact Morse Hy-Vo double reduction chain drive units made by Morse Chain Co., Detroit.

The primary chain reduction has standard 27 and 48-tooth



Check these Cleaning Results
of an eastern job plating shop

- ✓ Greatly improved results over vapor degreasing . . . resulting in better plating.
- ✓ Cost of cleaner reduced by 80%.
- ✓ Steel parts protected against rust up to two days.
- ✓ Elimination of hazardous vapors.
- ✓ Greater production through faster cleaning.
- ✓ Complete removal of metal chips from work.
- ✓ Low initial cost — low upkeep.

All these results are obtained with the Magnus Aja-Lif Method of cleaning. Write for details.

FOR THE DIFFICULT
Before you decide on *any* cleaning equipment, investigate the Magnus Methods designed for difficult cleaning.

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MAGNUS CHEMICAL CO., INC.
46 South Ave., Garwood, N. J.
In Canada: Magnus Chemicals, Ltd., Montreal
Service Representatives in Principal Cities

Modernization program pays off for scrap yard...

sprockets. The secondary reduction has standard 27 and 51-tooth sprockets, giving an overall 3.35 to 1 reduction.

The standard 1-in. pitch, narrow, compact chains have an average ultimate tensile strength of 100,000 psi. The chains are enclosed in individual, pressure-lubricated chain cases.

Long Wear Life

Maintenance-free, long wear life up to 20,000 hr is provided by the high speed chain drives, which give smooth, shock-free action, resulting from low-friction rolling joints, involute-formed sprocket teeth, balanced chain link design and high alloy steel links and pins.

An estimated investment of only about one-fourth the cost of a new crane was made possible by repowering the junked crane. The modernized crane is currently giving efficient service six days a week. Fuel costs for the diesel engine unit are estimated to be about 1/15 the cost of steam power.

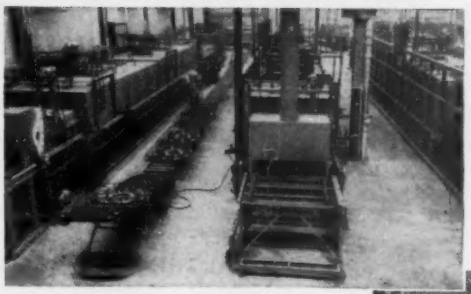
Saved for rebuilding . . .

Closeup of drive . . .

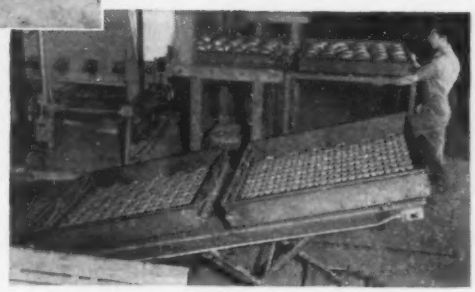
ROLOCK

FABRICATED ALLOYS

ROLOCK "SERPENTINE" BASKET LIFE
12 times that of former baskets
at SOLAR AIRCRAFT CO.



Jet burner plates leaving gravity belt for travel thru furnace.



Baskets ready for loading, others entering furnace.

Baskets that carry jet engine parts thru these 73½-foot gas atmosphere furnaces for continuous annealing must withstand the tough maximum temperature of 2150° F. That calls for skillful designing of baskets and use of high heat resistant material. Rolock supplied Incoloy baskets incorporating their exclusive "Serpentine" base design, with rolled sheet on two sides and sturdy round rod on the other two . . . all superimposed and integral with the "Serpentine" fully articulated bottom.

Baskets are 42" x 42" x 6" deep O.D. . . . weight 120 lbs., carrying a load of 200-250 lbs. As a replacement for baskets formerly used at Solar's Wakonda plant at Des Moines the new ones have, so far, given 12 times the service life.

Rolock engineers provide practical solutions of your container problem for heat treating or corrosion resistant processing . . . or will cooperate with your own departments for lower hour-cost designs and methods. We like tough problems . . . and welcome yours. Send them in!

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JOB-ENGINEERED for better work
Easier Operation, Lower Cost

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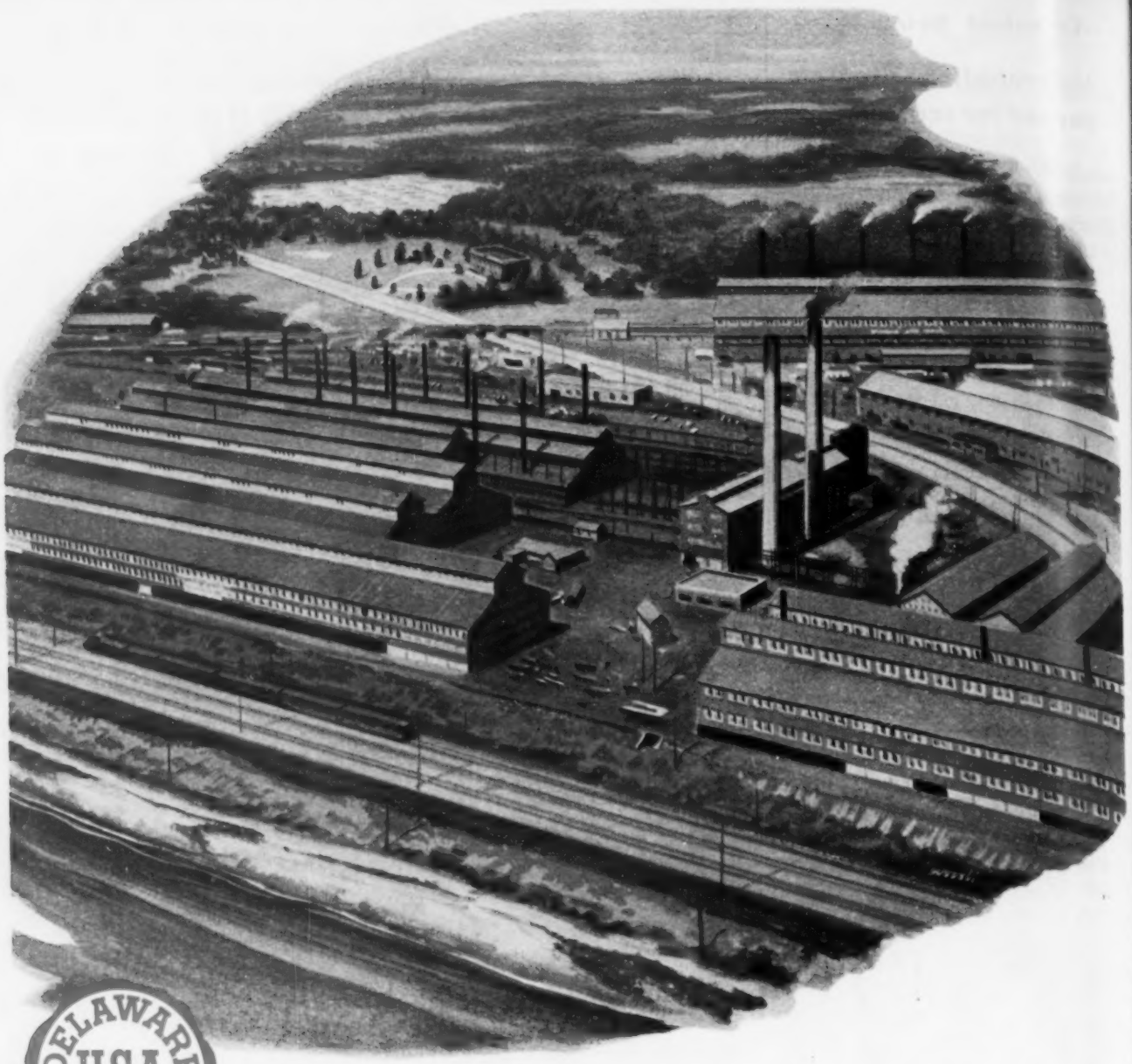

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America's fastest growing industrial area

HOME OF CLAYMONT STEEL

Here at Claymont, in the fast-expanding industrial empire on the Delaware River, are the open hearths, rolling mills, flanging shops, and pipe mill that turn out a wide variety of Claymont Products.

These include Alloy and Carbon Steel Plates . . . Stainless-Clad Plates . . . Flanged and Dished Heads . . . Manhole Fittings and Covers . . . and Large Diameter Welded Steel Pipe for transmission of oil, gas or water.

In our Claymont plant all of these products are under complete quality control starting with the making of steel in our own open hearth furnaces and continuing through every step of manufacture.

1961

CLAYMONT STEEL

WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION
CLAYMONT, DELAWARE

CF&I

the Iron Age
FOUNDED 1855
Markets and Prices

THE IRON AGE SUMMARY...

- **Steel business continues at a sturdy pace**
- **Ingot rate likely to continue at 75.0 pct**
- **Demand varies widely among products**

Although **the boom has eased,** steel business continues to set a sturdy pace. This bellwether industry gives no sign that the economy is headed into anything worse than a moderate decline. A lot of people are somewhat belatedly pointing out that this doesn't seem too unnatural after a record breaking year for most industries.

Steelmaking operations this week are scheduled at 75.0 pct of newly revised capacity, unchanged from last week. The industry seems likely to continue at about that pace for the next several weeks. After that, there might be mild improvement, as operations move toward a probable high for the first half in March.

A **number of important** steel consumers are alert to the possible influence of wage negotiations on their steel supply this year. Despite the fact that most steel firms must negotiate an entirely new wage contract before June 30, at least two large producers have been assuring their customers that a strike is highly improbable.

A strike of course would tighten the market overnight. Since a lot of consumers know this from personal experience, there may be a fair amount of strike-hedge buying of steel if the bargainers get close to contract termination without agreement. Added to expected spring buying, this could make steel business look pretty good during the first half.

If **the wage question** is settled amicably, the seasonal summer dip in steel business may be deeper this year than it has been since 1949.

A product run-down of the market reflects the comfortable tone of demand. Among the tonnage products, about the only tight item is seamless tubing. Next in line are structurals, particularly wide flange beams. Advance buying of sheets and other flat-rolled products has not lived up to expectations. However, tinplate is expected to pick up now that the can company strike has ended; outlook for the year on this product is bright—even in relation to 1953.

Stainless steel demand is noticeably stronger, but demand for alloy steel products still lags. Demand for tool steels is sluggish. Electrical sheets are moving well. Except for some specialties, wire products are very easy.

Hope for a spring upturn seems based at least in part on simultaneous resurgence of automakers and suppliers, farm equipment makers, and manufacturers of air conditioning and refrigeration equipment. Air conditioning gives promise of being the brightest star in the appliance field this year.

Steel producers are really surprised at the apparent heavy tonnages consumers held in inventory when they decided to reduce their stocks. Even though they now feel sure the inventory adjustment period must be nearing an end, they have repeatedly underestimated the length of time customers would be out of the market.

Recent price changes include: A reduction of $1 a ton by a Detroit producer of cold-rolled strip; all producers in that area are now competitive. Tool steel was reduced in line with lower tungsten prices (1¢ per lb for each per cent of contained tungsten). Another producer raised electrical sheets an average of about 3 pct.

Steel Output, Operating Rates

	This Week†	Last Week	Month Ago	Year Ago
Net Tons Produced (000 omitted)	**1,788**	**1,798**	**1,900**	**2,238**
Ingot Production Index (1947—49=100)	**111.3**	**111.9**	**118.3**	**139.3**
District Operating Rates				
Pittsburgh	89.0	90.0	91.0	106.0
Chicago	77.5	80.0	93.5	101.0
Philadelphia	80.0	83.0*	89.0	96.0
Valley	74.0	71.0*	77.0	103.0
West	81.5	76.5*	89.0	101.5
Cleveland	73.0	81.0*	78.0	99.5
Buffalo	63.5	75.0	87.5	100.0
Detroit	85.0	85.0*	81.0	106.0
Birmingham	95.0	95.0	96.5	95.5
Wheeling	86.0	88.0	88.0	104.0
S. Ohio River	84.5	79.5	81.0	93.5
St. Louis	64.0	67.0	88.0	93.0
East	76.0	74.5	66.5	95.0
Aggregate	**75.0**	**75.0**	**85.5**	**99.0**

Per cent of capacity for weeks in 1954 is based on annual capacity of 124,330,410 net tons as of Jan. 1, 1954. Per cent of capacity for last year is based on annual capacity of 117,547,470 tons as of Jan. 1, 1953.

* Revised.

† Tentative.

MAKING STEEL THAT MAKES A DIFFERENCE IN RINGS

By making its own steel in five open hearth furnaces, the Standard Steel Works Division constantly controls the steel in its forged rings and flanges. A combined yearly capacity of 200,000 tons of carbon and alloy steel are made by the acid open hearth method. This process makes possible more definite control of chemical reactions, assuring steel high in quality and tensile properties.

Thus one big reason why you should always call Standard for rings and flanges is the fact that Standard is able to produce and control the analysis and physical properties of the steel going into its products.

ONE OF SIX REASONS why you should always call Standard Steel for rings and flanges

1. **Quality Steel**—through production of own steel by acid process.
2. **Uniformity**—assured by precise control of forging and rolling operations.
3. **Testing**—modern laboratory control with radiographic tests, tensile tests, hardness tests, ultrasonic probing of internal structure, etc.
4. **Capacity**—unsurpassed ability to produce weldless rings all the way up to 144" O.D.
5. **Experience**—produced by skilled workmen with 20 to 40 years experience.
6. **Fast Service**—a vital factor in the continuing growth of Standard Steel for over 150 years.

Standard Steel Works Division

BURNHAM, PENNSYLVANIA

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Markets at a Glance

GE Transformer Output Best Ever . . . Reflecting the strength of the electric power industries, General Electric Co.'s Transformer Div., Pittsfield, Mass., reports output last year was 6 pct above that of the previous peak achieved in 1951. Company believes this year's production will be 6 pct better than it was last year.

Hotpoint Doubles Capacity . . . Despite predictions of increased competition and possibility of easing demand for the appliance industry, Hotpoint Co., Chicago, is planning a modernization program that will double its present capacity for production of automatic clothes washers and automatic electric clothes dryers.

Tool Steel Prices Drop . . . Due to drastic reductions in the cost of tungsten, tool steel producers have cut prices on tungsten-bearing high speed steels. Reductions amount to 1¢ per lb for each percent of contained tungsten on grades containing 6 pct or more. Producers say odd lots of tungsten have been going for "ridiculously low" bids in the past 2 months.

Britain Buys from Reds . . . British Iron & Steel Corp. has arranged to purchase more than 100,000 tons of Russian pig iron during the next 6 months.

Bakelite Cuts Prices . . . Bakelite Co. has reduced prices of phenolic molding materials, phenolic resins and phenolic resin solutions. Price of most standard phenolic molding materials has been dropped 1¢ per lb, unmodified phenolic resins are down 2¢ per lb, while the price drop on resin solutions varies with the solids content.

Sears, Roebuck Prices Dip . . . Sears, Roebuck & Co.'s new spring-summer catalog lists hundreds of items that are selling below prices listed in the catalog put out last fall. Prices in the new book average more than 1 pct less than those in the previous volume. Prices of 94 pct of the items shown in the '54 catalog are either lower or unchanged from the fall catalog.

Hold on Pig Iron . . . Price of Mystic Iron Works' foundry pig iron for January, February and March will remain at $63 per gross ton f.o.b. Everett, Mass., plus current differentials for silicon, phosphorous and manganese.

Ore from Orinoco . . . First shipment of iron ore from U. S. Steel's Cerro Bolivar mining development left Puerto Ordaz, Venezuela, for Morrisville, Pa., last week. Officials of the Orinoco Mining Co., the U. S. Steel subsidiary in charge of the Venezuelan ore development, say they hope to ship 3 million tons of ore this year and believe shipments will hit 5 million tons in 1955.

Silvery Pig Price Reduction . . . Keokuk Electro Metals Co. has reduced the base price of its silvery pig iron, both regular and alloy grades, $3.50 per gross ton.

Midwest Ordnance Production . . . Midwestern industry turned out approximately $1.55 billion worth of Ordnance equipment last year, reports Chicago Ordnance District. New procurement orders placed by Ordnance Dept. in the district during 1953 totaled $193 million. Of this about $187 million were committed during the first half of the year.

Car Builder Gets Tax Writeoff . . . Van Car Corp., Chicago freight car builder, has been granted a certificate of necessity for $42 million, 70 pct allowed.

Nicaro Nickel Expansion . . . Government plans to spend $43 million to expand capacity of its nickel plant at Nicaro, Cuba. The plant is now producing 14,000 tons of nickel per year. Capacity will be upped 75 pct after the expansion plan is completed. General Services Administration announced this move after the proposed expenditure had been certified as essential to defense.

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Last Week	Last Month	Last Year
Composite prices				
Finished Steel, base	4.634	4.634	4.634	4.376
Pig Iron (gross ton)	$56.59	$56.59	$56.59	$55.26
Scrap, No. 1 hvy. (Gross ton)	$28.83	$29.67	$30.67	$42.00
Nonferrous Metals				
Aluminum, ingot	21.50	21.50	21.50	20.00
Copper, electrolytic	29.75	29.75	29.75	24.50
Lead, St. Louis	13.30	13.30	13.30	13.80
Magnesium, ingot	27.75	27.00	27.00	24.50
Nickel, electrolytic	63.08	63.08	63.08	63.08
Tin, Straits, N. Y.	84.50	85.00	86.00	$1.21½
Zinc, E. St. Louis	10.00	10.00	10.00	13.00

Slab Zinc Stocks Up 15,000 Tons

Highest since mid-1947, smelter's zinc stocks now total 180,620 tons . . . Output for 1953 almost topped all time high . . . Magnesium prices adjusted—*By R. L. Hatschek.*

Year-end statistics of the American Zinc Institute showed a further increase of some 15,000 tons in smelter stocks of slab zinc. December was the seventh consecutive month to show an increase and the total has now mounted to 180,620 tons. This tonnage is the highest since mid-1947.

Daily average production of 2546 tons was approximately the same as the preceding month and total output for December was 78,921 tons. This 3000-ton excess over November results from the greater number of days in December. Production for the year 1953 totaled 970,935 tons, exceeding 1952 by approximately 9000 tons and coming within a day's output of the alltime record of 971,873 tons set in 1943.

Exports Up . . . Happiest aspect of the rather gloomy statistical roundup was the fact that the export category showed 5707 tons, doubling the November exports. This is in contrast to mid-year when exports faded to practically nil—only 36 tons in June.

But domestic shipments were off about 7500 tons to 56,090 tons, next to the lowest month of the year. Total shipments for December were 63,924 tons, off about 5700 tons. This brought the tonnage shipped during 1953 to 877,535.

Another glint of improvement was the 6000-ton increase in unfilled orders. New total as the year turned was 35,466 tons—still not high, but an improvement nevertheless.

Dow Shifts Pricing . . . Some magnesium price changes have been announced by Dow Chemical Co. effective Jan. 1. Base price of 20-lb 4-piece notched primary ingot is up ¾¢ to 27.75¢ per lb 12-lb round ingot is up 1¢ to 29.50¢ and primary sticks and turnings have been boosted 1¢ per lb.

Self-palletized 42-lb primary pig is unchanged at 27¢ per lb and alloy ingots are also unchanged. The firm says, "No adjustments are contemplated in prices of Dow's magnesium mill products."

New Warehouse Outlets . . . At the same time, the magnesium producer announced that it is now selling self palletized 42-lb pig at 28.2¢, 4-piece notched 20-lb ingot at 29¢ and 12-lb round ingot at 31¢ f.o.b. the Eastern Terminals Warehouse, Port Newark, N. J., and the first two at the same prices f.o.b. its Madison, Ill., warehouse.

It's said this will save New York area consumers up to ½¢ per lb as well as providing speedier delivery than previous shipments from the Texas plant.

Magnesium Assn. statistics for October showed total castings shipments of 1499 tons, well over the September tonnage of 1262. Sand, permanent mold and diecastings all registered increases. Respectively, the tonnages for October were: 915 tons, 304 tons, and 280 tons. The total was about 8 pct lower than Oct. 1952.

New Alloy Out . . . Harvey Aluminum Co. has announced development of a new aluminum alloy designated 66S. Harvey's aim was to develop an alloy combining cost advantages of 61S and higher strength of 24S. The firm guarantees a yield and tensile strength 31 pct greater than 61S.

Claims include: Low cost, strength characteristics of 24S, fabricating characteristics and corrosion resistance similar to 61S. Welding efficiency is stated to be better than harder alloys. Harvey does not indicate what mill products will be available nor does it give specific prices.

Plan Nickel Refinery . . . Falconbridge Nickel Mines Ltd. has announced it has acquired a 300-acre site where it will build a new nickel refinery. Located on the Welland Canal just outside Port Colborne, Ont., the plant will treat pyrrhotite concentrates. Present plans are for an annual nickel capacity at this plant of 7500 tons.

This is part of Falconbridge's expansion to a total annual nickel capacity of 30,000 tons. Another 7500-ton expansion is under way at the firm's Norwegian refinery. Demands of the new refinery may necessitate construction of another ore concentrator in addition to the three already planned for the Sudbury district.

Entire expansion is expected to cost about $42 million.

NONFERROUS METAL PRICES

(Cents per lb except as noted)

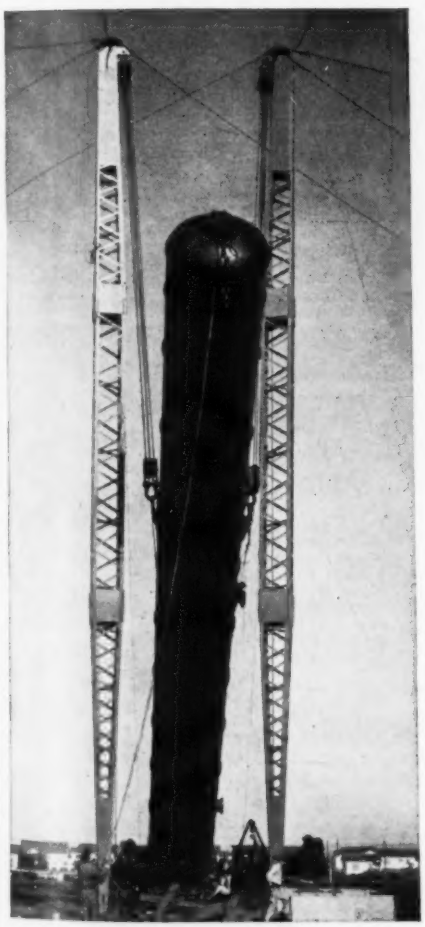
	Jan. 6	Jan. 7	Jan. 8	Jan. 9	Jan. 11	Jan. 12
Copper, electro, Conn.	29.50–30.00	29.50–30.00	29.50–30.00	29.50–30.00	29.50–30.00	29.50–30.00
Copper, Lake delivered	30.00	30.00	30.00	30.00	30.00	30.00
Tin, Straits, New York	85.25	85.25	84.75	....	84.75	84.75*
Zinc, East St. Louis	10.00	10.00	10.00	10.00	10.00	10.00
Lead, St. Louis	13.30	13.30	13.30	13.30	13.30	13.30

Note: Quotations are going prices
*Tentative

Multiple-part Red-Strand Slings are always trusted to handle heavy loads. They are easy to apply to both the load and the crane hook. User tests in Detroit proved Red-Strand slings withstood unusual abuse, yet maintained higher-than-rated strength.

A Gary plant uses Red-Strand single-part slings for many lifting jobs like this. These slings are available with various combinations of end fittings for attaching the sling to rings or lugs. Single-part slings frequently are the most economical to use.

How to Select the Correct Sling for Your Job



A heavy cylindrical load like this usually calls for the use of multiple-part Red-Strand Flat-Laced slings. They are strong, flexible and do not slip or abrade on smooth round surfaces.

Start your sling selection by analyzing five factors:

1. The load—its size, weight, shape, finish.
2. Working area, amount of head room.
3. Size and type of crane hook.
4. Angle of sling legs.
5. Location and type of lugs or rings, if any.

This is basic information. From it, your supplier can recommend the sling by type, size and length that is safest, longest lasting and most economical for your job.

Types of Slings

Multiple-part slings are always recommended for heavy duty service, because for equal strength they are far more flexible than single-part slings. They hug the shape of the load easily, present a greater bearing surface to the load, and reduce the possibility of marring finely finished surfaces.

Where these factors are not so important, either Red-Strand ***single-part slings*** or ***grommet slings*** may be used for economy. Single-part Red-Strand slings are often recommended for lifting lighter weight objects, or those that have fixed attaching rings or lugs. Grommet, or continuous strand Red-Strand slings are ideal for forming hitches of various types without fittings.

How to Gain Extra Savings

Two suggestions will help you save money on slings.

Re-useable Pin-Lock thimbles reduce sling costs by 21%

The first is to re-use Pin-Lock thimbles on multiple part slings. They increase sling life by protecting loops from abuse or damage. Besides, these exclusive Leschen Pin-Lock thimbles cut sling costs on an average of 21% because they may be used again and again. They lock into sling loops with pins instead of permanent clamps, permitting re-use, and eliminating constant expense of thimble replacements.

The second suggestion is to use Red-Strand slings—for a very simple but good reason: Red-Strand slings are made of ***higher-than-rated*** quality Leschen wire rope that delivers ***longer-than-expected*** service.

Get a copy of Leschen's *Sling Handbook* for complete information. Ask your Leschen man for one, or write.

LESCHEN WIRE ROPE DIVISION
The Watson-Stillman Company
(A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)
St. Louis 12, Missouri

LESCHEN
HERCULES *Red-Strand*
WIRE ROPE

(Advertisement)

Nonferrous Prices

(Effective Jan. 12, 1954)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.136 in. and thicker, 2S, 3S, 33.9¢; 4S, 36.0¢; 52S, 38.2¢; 24S-O, 24S-OAL, 37.0¢; 75S-O, 75S-OAL, 44.7¢; 0.081-in., 2S, 3S, 35.1¢; 4S, 37.7¢; 52S, 39.9¢; 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 46.9¢. 0.032-in., 2S, 3S, 37.0¢; 4S, 41.8¢; 24S-O, 24S-OAL, 46.9¢; 75S-O, 75S-OAL, 58.4¢.

Plate, ¼-in. and Heavier: 2S-F, 3S-F, 32.4¢; 4S-F, 34.5¢; 52S-F, 36.2¢; 61S-O, 35.6¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 44.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 37.4¢ to 82.8¢; 12 to 14, 38.2¢ to 99.0¢; 24 to 26, 40.9¢ to $1.29; 36 to 38, 48.4¢ to $1.89.

Rod, Rolled: 1.064 to 4.5-in., 2S-F, 3S-F, 43.8¢ to 87.2¢; cold-finished, 0.375 to 3.499-in., 2S-F, 3S-F, 47.6¢ to 89.3¢.

Screw Machine Stock: Rounds, 11S-T3, ½ to 11/32-in., 59.6¢ to 47.0¢; ⅜ to 1½-in., 46.6¢ to 43.8¢; 1 9/16 to 3-in., 42.7¢ to 39.9¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 44.1¢ to 32.4¢; 52S, 53.4¢ to 39.1¢; 17S-T4, 60.1¢ to 41.8¢; 61S-T4, 53.9¢ to 41.3¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼ to 2-in., 31.6¢ to 60.7¢; 2 to 4 in., 37.7¢ to 51.1¢; 4 to 6 in., 38.2¢ to 46.6¢; 6 to 9 in., 38.7¢ to 48.8¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42¾ x 60 in., $2.838; x 96 in., $4.543; x 120 in., $5.680; x 144 in., $6.816. Coiled sheet, per lb, 0.019 in. x 28 in.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and plate: FS1-O¼ in., 66¢; 3/16 in., 68¢; ½ in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specifications grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft, for perimeters less than size indicated; 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD, ¼ to 5/16 in., $1.43; 5/16 to ⅜ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86½	67½	92½
Strip, CR	92½	70½	98½
Rod, bar	82½	65½	88½
Angles, HR	82½	65½	88½
Plate, HR	84½	66½	90½
Seamless Tube	115½	100½	137½
Shot, blocks	....	60	....

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	46.41	....	48.48
Copper, h-r	48.38	44.73	....
Copper, drawn	....	45.98	....
Low brass	44.47	44.41	....
Yellow brass	41.72	41.66	....
Red brass	45.44	45.38	....
Naval brass	45.76	40.07	41.33
Leaded brass	....	....	39.11
Com. bronze	46.95	46.89	....
Mang. bronze	49.48	43.62	45.18
Phos. bronze	66.58	67.08	....
Muntz metal	43.96	39.77	41.02
Ni silver, 10 pct	55.36	....	62.63

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	21.50
Aluminum pig	20.00
Antimony, American, Laredo, Tex.	28.50
Beryllium copper, per lb conta'd Be.	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	29.50 to 30.00
Copper, Lake, delivered	30.00
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$165 to $175
Lead, St. Louis	13.30
Lead, New York	13.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb., pig	27.00
Ingot	27.75
Magnesium, sticks, 100 to 500 lb.	46.00 to 48.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$187 to $190
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	$22 to $24
Platinum, dollars per troy oz.	$91 to $93
Silver, New York, cents per oz.	85.25
Tin, New York	84.75
Titanium, sponge	$5.00
Zinc, East St. Louis	10.00
Zinc, New York	10.50
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered carloads)

85-5-5-5 ingot	
No. 115	24.50
No. 120	23.75
No. 123	23.25
80-10-10 ingot	
No. 305	28.75
No. 315	26.50
88-10-2 ingot	
No. 210	37.50
No. 215	34.00
No. 245	29.50
Yellow ingot	
No. 405	20.75
Manganese bronze	
No. 421	25.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	22.50-23.00
0.60 copper, max.	22.00-22.75
Piston alloys (No. 122 type)	19.75-21.00
No. 12 alum. (No. 2 grade)	19.50-19.75
108 alloy	20.00-20.75
195 alloy	21.00-21.75
13 alloy (0.60 copper max.)	22.00-22.75
ASX-679	20.00-20.75

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—96-97½%	20.75-21.50
Grade 2—92-95%	19.75-20.50
Grade 3—90-92%	18.50-19.50
Grade 4—85-90%	17.00-18.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	44.54
Electrodeposited	38.38
Flat rolled	47.14
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	84.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63.90
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz. lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	54.30

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	25¾
Yellow brass	19¾	18
Red brass	23	22½
Comm. bronze	23⅞	23⅛
Mang. bronze	18¼	17½
Yellow brass rod ends	19½	....

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	24	—24½
No. 2 copper wire		22½
Light copper		21
*Refinery brass	19½	—20

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	23½	—24
No. 2 copper wire	22	—22½
Light copper	20½	—21
No. 1 composition	18	—18½
No. 1 comp. turnings	17½	—18
Rolled brass	14½	—15½
Brass pipe	15	—16
Radiators	13½	—14
Aluminum		
Mixed old cast	10¾	—11½
Mixed new clips	12½	—13½
Mixed turnings, dry	11¼	—12
Pots and pans	10¾	—11½

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	23
No. 2 heavy copper and wire	21
Light copper	19
New type shell cuttings	19
Auto radiators (unsweated)	12½
No. 1 composition	17
No. 1 composition turnings	16½
Unlined red car boxes	14½
Cocks and faucets	14½
Mixed heavy yellow brass	11
Old rolled brass	14
Brass pipe	16
New soft brass clippings	17
Brass rod ends	14½
No. 1 brass rod turnings	12

Aluminum

Alum. pistons and struts	6	— 6½
Aluminum crankcase	9	— 9½
2S aluminum clippings	12	—12½
Old sheet and utensils	9	— 9½
Borings and turnings		6
Misc. cast aluminum	9	— 9½
Dural clips (24S)	10	—10½

Zinc

New zinc clippings	5
Old zinc	3½
Zinc routings	2
Old die cast scrap	3¼

Nickel and Monel

Pure nickel clippings	60	—65
Clean nickel turnings		40
Nickel anodes	60	—65
Nickel rod ends	60	—65
New Monel clippings	22	—24
Clean Monel turnings	14	—15
Old sheet Monel	20	—22
Nickel silver clippings, mixed		14
Nickel silver turnings, mixed		12

Lead

Soft, scrap, lead		10½
Battery plates (dry)	5½	— 5¾
Batteries, acid free		3½

Magnesium

Segregated solids	20	—21
Castings	19	—20

Miscellaneous

Block tin	65	—67
No. 1 pewter	40	—42
No. 1 auto babbitt	37	—38
Mixed common babbitt	11	—12
Solder joints	14	—14½
Siphon tops		35
Small foundry type		15
Monotype		13½
Lino. and stereotype		12½
Electrotype		11
Hand picked type shells	7	— 8
Lino. and stereo. dross	4¾	— 5
Electro dross	3½	— 3½

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Chase Free-Cutting Brass rod yields short chips as it is machined. The result is much easier cutting, longer tool life. Products produced are smoother, cleaner-surfaced, less expensive to buff or polish before lacquering, enameling or plating.

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Cincinnati	Indianapolis	New Orleans	St. Louis	

Scrap Off to Slow Start in New Year

January fails to bring mill buying . . . Prices continue downward slide in most districts . . . Steelmaking grades are hardest hit . . . Many dealers shy of sales at present prices.

The scrap trade continued glum halfway through the first month of the New Year. In many areas, dealers and brokers felt relieved if prices stayed still. But they were often disappointed as quotations generally continued to decline in most districts.

Steelmaking grades continued to be hardest hit, with THE IRON AGE No. 1 Heavy Melting Steel Scrap Composite off another 84¢ to $28.83. Electric furnace grades also fell off at most steelmaking centers, as did many railroad items. Blast furnace grades moved sympathetically with steelmaking quality items, except in some areas where they had apparently hit bottom in recent weeks.

Pittsburgh—Despite the recent purchase by an independent mill, market outlook is dreary. Consumer inventories remain high, and one steel producer recently turned down a lot of choice customer scrap. Latest buy confirmed THE IRON AGE prices on openhearth grades. Some railroad grades declined further on basis of bona fide offers to sell, and on dealer-broker transactions.

Chicago—After some involved purchases that raised hopes slightly 2 weeks ago, this market resumed its downward slide. Mill sales of scrap were almost negligible. When expected mill buying failed to materialize a feeble gleam of optimism vanished. Scrap inventories are reported high in the area, despite a lack of peddler activity. Layoffs of yard help are reported to be increasing rapidly, particularly in the past 2 weeks. Industrial scrap is moving but no great cross-section of producers is represented in this movement.

Philadelphia—As one dealer put it, "Snow's heavy—but it won't have any effect on the market." Only one local mill was taking steelmaking scrap early this week at prices of $27 to $28 for No. 1 heavy and No. 1 bundles, $24 to $25 for No. 2 heavy, and $22 to $23 for No. 2 bundles. Low phos grades and railroad items slipped off on appraisal, while cast items continued unchanged as foundry activity remains fair.

New York—With virtually no business in steelmaking grades in this area, a price decline in an adjacent consuming district lowered prices here $1 on appraisal for those grades. Blast furnace material remained at previous levels, strengthening belief they had hit bottom. Cast movement continued fairly strong, with unchanged prices. Rumors of coming export deals persisted, but nothing concrete is detectable for the East Coast this week.

Detroit—The only strength in this scrap market is in cast, which is holding firm although the pattern is shifting. A large tonnage of clean auto cast placed on the market depressed this category somewhat, but No. 1 cupola increased correspondingly. Steelmaking and blast furnace grades resumed their downward trend with very little buying at the moment or in prospect. Turnings are particularly weak with no market in sight.

Cleveland—Brokers cannot find a home even for good production material. No. 1 heavy melting and low phos dropped 50¢ in the Valley as major consumers continued to hold up shipments. Most dealers and brokers can't see any improvement until March. They feel any increase in first quarter steel buying will be followed by February releases on old orders.

Birmingham—Southern steel mills are confining their purchases of scrap steel to No. 2 heavy melting. Brokers report that as a result, supplies of this category are getting tight. Limited quantities of cast are being bought by foundries in the area at unchanged prices. Movement to northern mills has picked up a little since the first of the year. Brokers report a further decline of from $1.50 to $2 per ton in some grades of steel, with others unchanged.

St. Louis—The scrap market is quiet, with neither mills nor brokers eager to transact business. Offerings have been light because of generally lower prices and railroad lists have been small. One district mill suspended operations in two of its large openhearth furnaces and its smallest. District rate is down to 63.9 pct. An Iowa mill came into the market for borings and turnings at a reduction of $2 a ton.

Cincinnati—No. 1 heavy melting steel fell another dollar to $26. All other openhearth grades went down sympathetically on appraisal. General weakness also affected blast furnace grades. Low phos dropped $2 to $35 on the basis of a small tonnage sale.

Buffalo—Decline in scrap prices was halted at least temporarily by a sale of No. 1 heavy melting at a shade above prevailing quotations. Leading mills however, are still out of the market and sentiment favors the bearish side as ingot production declined rather sharply here. Prices are nominally unchanged.

Boston—Leftover holiday lull plus blizzard conditions on top of an already quiet market has left the New England scrap trade at an absolute standstill. Prices on openhearth grades dropped anywhere from $1 to $3 per ton with No. 1 heavy and No. 1 bundles now priced at a flat $19, No. 2 steel at $15 and No. 2 bundles at $13.

West Coast—The scrap market hit its lowest ebb since 1949 last week with all three major steel producers pulling completely out of the market for January at all mills. Small purchases toward the end of the month were only a slight possibility.

Hamilton, Ont.—The market here is sick. Mill inventories are so high some claim they lack storage space for any more material. Buying is nil, despite severely depressed prices. Some distress selling from U. S. sources has also hurt the home trade. Dealers' yards are full, and there is little hope of export business until spring opens navigation to the seaboard.